

MARINE REVIEW.

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List of Car Dump Machines.

Practically all the soft coal to be moved from Lake Erie ports to the upper lakes during the present season of navigation will be transferred to vessels by car dump machines. The cost at which coal is handled by these machines is so low that all railway companies and dock companies engaged in the lake trade have been forced to adopt them. Shipments over docks that are not equipped with these machines will be confined this year to cargoes that go into small vessels for points on the St. Clair and Detroit rivers and for the smaller ports where accommodations are not provided for the large lake carriers.

As shown by the list on this page, there are now fifteen of these machines at the several Lake Erie ports, in addition to two other large coal transfer plants—one on the docks of M. A. Hanna & Co. at Ashtabula and the other on the Baltimore & Ohio Ry. Co.'s docks at Sandusky—which are constructed on principles entirely different to the car dumps but are of about equal capacity. These seventeen plants, aside from the value of docks on which they are built, represent an investment of probably \$600,000. Definite figures as to the cost of handling coal by these machines, as compared with old methods, are not at hand, but it is more than probable that the difference in the business of two seasons would fully equal the investment. But another great advantage to the consumer of coal in the northwest (reductions are eventually made in the cost of the coal to the consumer) is the lower lake freight brought about by these machines working in conjunction with large lake ships. With any of these car dumps 4,000 tons of coal may be transferred to a ship in a day of ten

Disagreement follows Elevator Pool.

Buffalo, April 27.—In a newspaper dispatch sent out from Chicago, a few days ago, Joseph Leiter, of wheat corner fame, was credited with having changed orders regarding some vessels carrying his wheat, so as to relieve the elevator blockade here. He was credited with saying to the vessel men: "I would not like to have my own property tied up. I will not tie up yours." This sounds well, but there is no truth in it. There are several cargoes here now, contracted by the New York Central through to New York, including Buffalo charges, and the bills of lading are made accordingly. Mr. Leiter has nothing to do with the unloading of these cargoes after the contracts are made, and cannot dictate to the railroad companies, even if he wanted to, which is altogether unlikely.

Since the elevator association has been reorganized there will be less object in the case of the New York Central insisting upon unloading at the City elevators all the grain they contract, for the reason that all the earnings will go into a common pool. Vessel men do not, therefore, expect as much bunching of vessels as they have experienced since the opening of navigation. It is understood on very good authority that there are no elevators in the new pool except those that have storage capacity and canal connection. The "dead-wood" elevators, as they have been called, will not be in this year's association, and the rate for elevating will be five-eighths of a cent, including ten days' storage, instead of seven-eighths of a cent, which has been the rate for a great many years past.

It is figured that on a basis of last year's business this reduction of a quarter of a cent in elevating charges, together with the reduction of 25

List of Car Dump Machines for Transfer of Coal from Railway Cars to Ships at Lake Erie Ports.

LAKE PORT.	MACHINE ON DOCKS OF	BUILT BY
Toledo.....	Columbus, Hocking Valley & Toledo Ry. Co.....	Brown Hoisting & Conveying Machine Co., Cleveland.
Toledo.....	Toledo & Ohio Central Ry. Co.....	Brown Hoisting & Conveying Machine Co., Cleveland.
Sandusky.....	Columbus, Sandusky & Hocking Rd.....	Webster, Camp & Lane, Akron, O.
Huron.....	Huron Dock Co.....	Brown Hoisting & Conveying Machine Co., Cleveland.
*Lorain.....	Cleveland, Lorain & Wheeling Ry. Co.....	McMyler Mfg. Co., Cleveland.
Cleveland.....	Cleveland & Pittsburg Ry. Co.....	Brown Hoisting & Conveying Machine Co., Cleveland.
Cleveland.....	Valley Coal Transfer Co. (Valley Ry. docks).....	McMyler Mfg. Co., Cleveland.
Cleveland.....	Erie Coal Transfer Co. (Erie Ry. docks).....	Excelsior Iron Work Co., Cleveland.
Cleveland.....	Cuddy-Mullen Coal Co. (Penn. Co.'s docks, lake front).....	McMyler Mfg. Co., Cleveland.
Fairport.....	Pittsburg, Fairport & Northwestern Dock Co.....	McMyler Mfg. Co., Cleveland.
Ashtabula.....	Pickands, Mather & Co. (L. S. & M. S. Ry. Co.'s docks).....	McMyler Mfg. Co., Cleveland.
Ashtabula.....	Youghiogeny River Coal Co. (L. S. & M. S. Ry. Co.'s docks).....	Brown Hoisting & Conveying Machine Co., Cleveland.
Erie.....	Pennsylvania Co.....	McMyler Mfg. Co., Cleveland.
*Buffalo.....	Rochester & Pittsburg Ry. Coal & Iron Co.....	Webster, Camp & Lane, Akron, O.

* Under construction.

Two other coal transfer plants, one on the docks of M. A. Hanna & Co., at Ashtabula, and the other on the Baltimore & Ohio Ry. Co.'s docks at Sandusky are constructed on principles entirely different to the car dump machines but are of about equal capacity.

hours, as against two to three days required to load such a cargo by means of the old style of machinery. Cargoes equally large are often unloaded at upper lake ports, where special machinery is also provided, in a day or little more than a day. It is this dispatch in port that has enabled coal shippers to make contracts this season for moving coal from Ohio ports to the head of Lake Superior at 20 cents a ton to Oct. 1, or 25 cents a ton for the full season. The distance is practically 1,000 miles. A few years ago the ruling rate was 50 cents, and even that figure was then thought to be very low.

The Old Dominion Steamship Co. is the first of the Atlantic coast liners to begin replacing ships sold to the government. This company, a few days ago, placed an order with the Roach ship yard, Chester, Pa., for two steel steamers to take the place of the Yorktown, which was sold to the government, and the Roanoke, which was sold to Pacific coast parties. They will be duplicates, practically, of the Princess Anne, which left the Roach yard in July last, and are for service between New York and Norfolk. They will each be 324 feet over all, 304 feet on water line, 42 feet beam and 27 feet depth of hold. Engines will be triple expansion with cylinders 27, 44 and 73 inches in diameter, and the pistons will have a common stroke of 54 inches, generating 4,000 horse power and driving a cast steel propeller, 16 feet in diameter, at the rate of about ninety-four revolutions per minute. The ships will have a speed of 16 knots an hour. Each ship will have four Scotch boilers, each 14 feet 6 inches in diameter and 12 feet 6 inches long. The working steam pressure will be 190 pounds to the square inch. There will be three decks and capacity for 2,000 tons of freight in addition to 120 first-class and fifty second-class passengers.

Uniforms will be worn hereafter by captains and mates of vessels of the Bessemer fleet. This is an innovation on lake freighters. It was suggested by some of the captains of the line. The uniforms are very neat, of blue material with monogram brass buttons and yachting style of cap. All mates on steamers of this line are men holding master's papers, and are paid \$100 a month, the same as is paid to captains of tow barges. Mates of the steamers and captains of the tow barges are to be regarded on an equal basis, as the idea for the future is to have men in charge of the steamers who have had experience in the handling of tow barges.

The Milwaukee Tugboat Line has issued a new towing tariff. It shows a general rearrangement of classes and a reduction of rates, which, in some cases, is fully 15 per cent. The heaviest cut is made in connection with steam vessels, and the larger towbarges are also favored in that direction. The new rates are already in effect.

cents per thousand bushels in shoveling, will mean a difference of about \$450,000 in transfer charges on all grain passing through this port. This is an item that should certainly help to retain for the lakes a large part of the export grain which it is claimed has been drifting to southern routes. The Great Northern (J. J. Hill) elevator is said to be free of the pool and the management of the new Export elevator is also understood to be free of the arrangement, but they will maintain rates fixed by the association. Officers of the pool, which is known as the Western Elevating Association, are: President, Geo. F. Sowerby; vice-president, E. W. Eames; secretary, P. G. Cook.

Buffalo, April 27.—When the above report was written as the result of a meeting held on Saturday last, it was supposed by elevator owners and managers that they had reorganized the association, but today some disagreement arose and the association went to pieces. Elevators are now offering to elevate and transfer for one-eighth of a cent a bushel. It is probable, however, that this condition will not last very long, as it will not pay the expense of running the elevators.

It is evident from present plans for mining operations at old range Bessemer properties, that on the Gogebic range in particular the days of largest production have been seen at a number of mines. A few will make large outputs, but in other cases 1898 will further emphasize the drain that has been going on for the past decade. It cannot be gainsaid that the rate of Bessemer ore consumption in the past few years has made more of an impression on Lake Superior reserves than many have appreciated. There is no encouragement, moreover, in the present level of prices to any large outlay in exploratory work that shall bring to light supplies not now in sight. It would appear that the Mesabi must cut more of a figure with each succeeding year if the enormous rate of Bessemer steel production in 1897 is to keep up in the next few years. Indications are that Lake Superior ores will increase their eastern trade by several hundred thousand tons this year. The Cuban ore mines, which have been under Spanish protection, have now ceased shipping and the embargo may last for months.—Iron Trade Review.

Quadruple expansion engines for the big Rockefeller freight steamer building at the works of F. W. Wheeler & Co., West Bay City, are to be larger than engines of the high-powered passenger steamers North West and North Land—that is, larger than a single set of the twin-screw engines in the passenger ships. Cylinders of the engines building at West Bay City are to be 26½, 37, 54½ and 80 inches diameter by 42-inch stroke of piston. Cylinders of the duplicate engines in the passenger ships are 25, 36, 51½ and 74 inches by 42-inch stroke. The Rockefeller steamer is to have four Scotch boilers, each 13 feet 4 inches by 11 feet 6 inches with 200 pounds steam pressure.

Concrete for Lake Breakwaters.

Two illustrations on this and the opposite page were made from photographs of the breakwater at Marquette, Mich., taken during the winter period when the thermometer in various parts of the Lake Superior region drops to 10 or 15 degrees below zero, or even lower temperatures. The views convey an idea of winter weather in the northern lake region. They were loaned to the Review by Mr. Clarence Coleman, United States assistant engineer, who is in charge of the work of reconstructing the Marquette breakwater under the direction of Major Clinton B. Sears, corps of engineers, U. S. A. Major Sears is in charge of the several important harbor works on Lake Superior, not least among which is the Marquette breakwater. The rebuilding of this breakwater is interesting from an engineering standpoint on account of the extensive use of concrete in the superstructure, and from the fact also that portions of the work thus far completed have been exposed to storms and great extremes of climatic conditions, as indicated by the pictures.

The original project at Marquette provided for a breakwater 3,000 feet long, composed of timber cribs ballasted with rock. This breakwater was completed in 1894 at a cost of \$469,732, but as at other ports around the lakes where piers and breakwaters of similar construction are in several instances being rebuilt—some of them with concrete superstructures—it was found that a large portion of the timber superstructure soon decayed and gave way, and that the whole of it would have to be renewed every twenty or twenty-five years. Work on the present concrete superstructure, estimated to cost about \$230,000 for the whole length of 3,000 feet, was begun in the spring of 1895, and about 1,000 feet of this new work was completed at the close of navigation last year. It seems to be fully capable of resisting the influences of violent storms and very low temperatures. The work was at first slow of progress on account of the



WINTER SCENES ON LAKE SUPERIOR—MARQUETTE BREAKWATER.

From a series of pictures prepared to indicate conditions of weather to which a concrete breakwater is subjected.—Major Clinton B. Sears, Engineer.

short period of weather in summer months suited to such operations. The building of the first short section also demonstrated the great difficulty of putting in, at and below the water surface on the lake side, the footing at the toe of the lower slope, owing to the irregularity of the cribs, and the almost constant wash from the surge of the sea. It was determined to change the construction of this part by using blocks of concrete instead of monolithic concrete in situ. As it was necessary that these blocks should have sufficient hardness to stand handling, and as a delay in their construction until warm weather would postpone the main work, designed to rest on their inner edges to very late in the working season, at best very short, it was arranged to build these blocks under cover to avoid freezing during the winter. This was successfully accomplished at small cost, considering the excellent results obtained. Progress under this plan has been quite satisfactory. As the work has been carried on by hired labor, the full details, such as analytical cost of construction, results of two years of cement testing, etc., are in the hands of the government engineers and are of special professional interest. This information, carefully compiled by Mr. Coleman, will be found in the last report of Major Sears regarding the improvement of rivers and harbors on Lake Superior, which has been issued in pamphlet form, and which, alike to the reports of other district officers, is printed as an appendix to the annual report of the chief of army engineers for 1897.

The people of Toledo have voted in favor of an issue of bonds to the amount of \$50,000 for improvements in the city fire department. No part of this fund is to be used for a fire boat. It is a great mistake that Toledo with its large and valuable water frontage should be without a fire boat.

Charts of Georgian bay will be required by most of the captains of vessels of the medium class during the present season, on account of the increasing traffic in that direction. The Marine Review has in stock at all times the best charts of Georgian bay that are made.

Steel Barge Maida.

The new steel barge Maida, launched at the ship yard of the American Steel Barge Co., West Superior, on Wednesday of last week, is a vessel capable of carrying about 6,400 net tons on 16½ feet draft. A description of this vessel will prove interesting, as she may be classed among the best of modern lake barges. The Maida will be owned by the Minnesota Steamship Co. She was practically ready for service when launched, and will probably be in commission within the coming week. Her dimensions are: Length over all, 390 feet; length between perpendiculars, 376 feet; beam, 46 feet; molded depth, 26 feet; registered tonnage, 3,474.78 tons gross and 3,210.74 net. The vessel has main deck beams but no deck laid on them, as she is intended for bulk freight, mainly iron ore. The spar deck forward is raised to the height of the main rail, so as to form a forecastle for crew's quarters, steam towing machine, etc. In the deck house aft, which is also of steel, are located pilot house, officers' quarters, dining room, etc. There is a water bottom of 4½ feet depth and 2,500 tons water ballast capacity. The cargo hold contains three collision bulkheads, one forward and two aft. Space between the after bulkheads is used as a wrecking well. The channel system prevails in construction of the vessel. There are thirteen cargo hatches of 24 feet centers, each hatch being 28 by 8 feet in the clear. One of the hatches is a trunk hatch, running down from the forecastle, which permits of cargo being loaded well out to the extreme forward part of the vessel. The Maida will be rigged as a three-masted schooner, similar to the barges Constitution and Nasmyth. Masts will be of steel, 92 feet in length, and the spread of canvas will be sufficient to enable her to make port in event of accident to the towing steamer. The outfit will include an electric light plant, steam towing machine for handling of tow lines, and three steam winches for handling of mooring lines; also steam steering gear, steam windlass

and capstans, ballast pumps, etc., all of which will be supplied with steam from a Scotch boiler at 120 pounds pressure. The Maida is the first vessel to be constructed under the direction of Mr. D. E. Ford, who was with the Standard Oil Co. for several years, and who, as superintendent, joined Capt. Alex. McDougall several months ago in the management of the West Superior works. The plans were made by A. C. Diericx, chief draftsman, and the representative of the Minnesota company in the construction of the vessel was Robert Curr of Cleveland.

St. Paul Salvage Award.

A New York dispatch of Tuesday last announced that affirmation had been given in the United States circuit court of appeals, of the decision of the district court in the suit of the Merritt Wrecking Co. against the American line steamship St. Paul, in awarding salvage to the amount of \$131,012.48 against the vessel, for pulling her off the coast of New Jersey, where she stranded in February, 1897. Only once has a larger amount of salvage been awarded. Salvage on the cargo was also affirmed to the amount of \$28,987.52.

It was held by the steamship company that the valuation of \$2,000,000 placed on the vessel by the district court was too high. It was shown, however, that the actual cost of the vessel was \$2,650,000, which, it was asserted, was 30 per cent. more than she could have been built for in England. But allowing for this and for the damage done her by stranding, it appeared to the court of appeals that her value was approximately \$2,000,000. The salvage allowed was about 6½ per cent. Two million dollars was placed as the value of the cargo, about \$1,000,000 of which was gold. It was contended that the salvors should recover not more than \$100 on this—the mere cost of lighterage—since it was conveniently packed in boxes and easily handled, and because it paid a high rate of freight. Judge Lacombe did not allow this contention.

Northwestern Coal Railway Co.'s Big Dock.

The dock of the Northwestern Coal Railway Co. at Superior, Wis., is by far the largest coal dock on the lakes. Vessels of the largest type are unloaded at this dock in ten to twelve hours. As the dock is now equipped the work of unloading five large ships may be carried on at one time. During the rush that followed the settlement of the coal strike last fall 5,000 tons were unloaded from one vessel in ten hours. This dock was built with the object of reducing the cost of handling and distributing coal to the railroads that have terminals at the head of the lakes. Direct communication with all railroads leading to the north and middle west is its main advantage. It is used by a concern that formerly had its business scattered over five smaller docks, anywhere from one-half to four miles apart. Each dock was connected with a separate railroad, which could, therefore, demand its own terms for switching. The dock company is now able to do its own handling of cars and switching and demand pay from the railroads.

The dock is 3,000 feet long and 500 feet wide, and has a frontage for unloading boats of 1,500 feet. The rest of the distance is taken up by a freight yard for handling cars in and out. There are sufficient tracks to accommodate 200 to 250 cars a day. The site where the coal is piled is 1,400 feet long and 400 feet wide, and is capable of holding 400,000 tons. One million tons are easily handled over the dock in a year. The structure stands on piles and cribs driven and sunk in the sand bottom, which is from 5 to 3 feet below the surface. The whole foundation was filled with sand pumped in by the hydraulic dredge used to dig the channels and slips about it. All the work was done by the company; no contracts were let. A hydraulic dredge was purchased, and it is claimed the work

the bucket from the hold of the ship to the top of tramway is 400 feet per minute, and along the tramway 1,600 feet per minute. From thirty to forty tons of coal can be unloaded in an hour by each hoist. The buckets hold one and one-and-a-half tons. At both ends of the tramway is a chute so arranged that coal can be dumped directly into cars without extra handling except spreading it over the car floor. The same train is often loaded partly from the ship and partly from stock piles.

Conveyors in the newer portion of the dock consist of four movable tramways, running on elevated ways, moved by means of a cable so as to come directly over the hatches of the boat to be unloaded. These four cover the space occupied by twenty stationary ones. The motive power is furnished by the long shaft, as is also that used for hoisting and conveying. One man on each tramway is all that is necessary to move them and to run the hoisting and dumping machinery. He can stand in his shed on the tower and automatically load a train or dump on a stock pile. The speed of these is the same as that of the others. In every case one bucket is being filled while the other is being dumped. The dock is supplied with four railroad tracks running its length, along the front and at the back end of the conveyors. The tracks are far enough below the dock level to bring the car sill even with the floor. In this way loading by hand is made easy. A man pushes his wheelbarrow into the car and dumps his coal without having any heavy inclines to go up. On the shore end of the dock are the railroad yard, car scales and office. Here trains are made up and sent out over a belt line to the road they are billed for. The belt line is thirteen miles long and crosses nearly all the roads centering at the head of the lakes. They are seven in number and reach every point in the west and northwest. This is one of the particular advantages of the system and has proved a great success.



WINTER SCENES ON LAKE SUPERIOR—MARQUETTE BREAKWATER.

From a series of pictures prepared to indicate conditions of weather to which a concrete breakwater is subjected.—Major Clinton B. Sears, Engineer.

was done for little over one-half the sum required by dredging companies. The cribs are filled with rock and sand and form a bed for the floor and superstructure.

The power house, situated at the outer end of the dock, is supplied with six 120-horse power boilers, a steam pump for fire purposes and two engines of 250 and 125 horse power respectively. They transmit power to the main shaft by rope-driving. One-piece belts were tried, but the rope proved more efficient and much cheaper to replace. The shaft, along the edge of the dock, is 950 feet long. The forty-four hoists and conveyors are run by it. Its great length has never given any trouble, and the small engines stationed at short intervals, the plan generally adopted in cases of this kind, are entirely done away with. In this manner running expenses are greatly reduced, since only two or three engineers are needed and the coal consumed is less.

The superstructure consists of forty-four tramways erected at intervals of 24 feet. The first forty, which extend for 1,000 feet, are built of wood. They consist of a hoisting tower at the dock front about 50 feet high and a trestle of frame work 475 feet long and 25 feet high. It supports a wire rope that carries the buckets of coal from the tower to the dumping place. When in use, one man, stationed in the tower, can tend to all the hoisting, running and dumping of his tramway. The unloading of the coal is carried on in the following manner: When the ship reaches such a position that the end of a tramway comes opposite the hatch two or more buckets are lowered into it. As soon as one is filled by the stevedores it is hoisted out and sent to the pile and dumped automatically. The arrangement for operating buckets consists of two drums which take their power from the shaft. One hoists the bucket out of the vessel and the other runs the car back and forth on the tramway. The speed of

To Succeed Theodore Roosevelt.

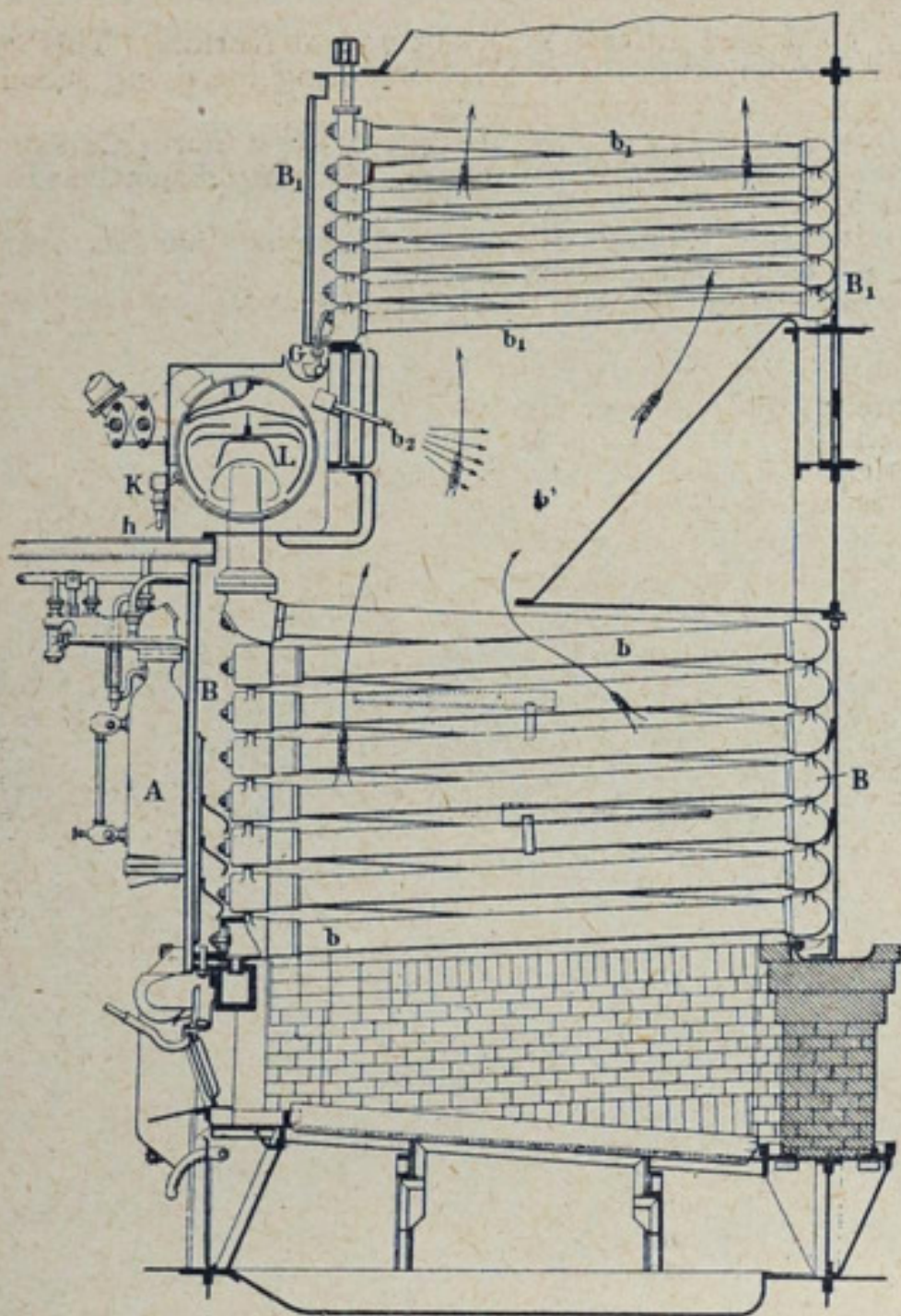
Rear Admiral J. G. Walker, U. S. N., who was chairman of the light-house board when retired about a year ago, may be the successor of Theodore Roosevelt as assistant secretary of the navy. Notwithstanding the pressure exerted by the president and his friends, Mr. Roosevelt has expressed his determination to resign his office and seek active service in the army. Mr. Roosevelt feels that the work of a civilian in the office he holds ends with the completion of the war preparations, and that subsequent duty of the incumbent will be more in the nature of an adviser, which can best be performed by a naval officer. Secretary Long is desirous, it is understood, that Rear Admiral Sicard shall continue as his naval adviser, and the duties of assistant secretary of the navy are too arduous for any man to attempt to occupy another office at the same time. It is pointed out that President Lincoln, during the Rebellion, appreciating the necessity of having a naval man as assistant secretary, shown by his action in appointing Gustavus A. Fox, formerly of the navy, to this office. Rear Admiral Walker is best qualified to perform the work which in time of war will devolve upon the assistant secretary. He has been a member of the naval strategy board and is thoroughly in touch with the plans of attack and defense, both by the war and navy departments. His friends declare that his experience in commanding two naval squadrons, his handling of delicate diplomatic questions in the past, and his general and varied knowledge of naval requirements peculiarly fit him for appointment as Mr. Roosevelt's successor.—Army & Navy Journal.

Subscribers who wish to have the Marine Review delivered to them through the marine postoffice, Detroit, will please notify us at once.

Economizers in Belleville Boilers.

John A. Currier, who is in charge of machinery of the Northern line passenger steamers, sends the Review drawings of a Belleville water tube boiler fitted with economizers. At a recent meeting of the Institution of Naval Architects in London, Sir John Durston, engineer-in-chief of the British navy, presented reports of trials of large cruisers, several of which are fitted with Belleville water tube boilers. The first vessels of the British fleet fitted with boilers of this type were built in advance of the adoption of the so-called economizers in the French boilers, and there was an opportunity, therefore, to compare their performance with that of vessels built later, in the boilers of which the economizers had been applied. In summaries of these trials submitted to the British society, the chief naval engineer reported a marked gain in fuel economy, so much so that the economizers will undoubtedly be used in all boilers of this kind in the future. Although an effort was made to train stokers especially for the operation of these boilers in the English navy, Mr. Currier seems to think that with proper firing the great loss of fuel that has been seen going out of the chimneys of the North West and North Land in great volumes of smoke could be avoided.

"I send you," he says, "plans of a boiler with economizers, as I consider that the best explanation I can give of them. If you could get firemen to carry their fires at all times, the old type of Belleville boiler would be all right without economizers, but if they are not continually watched they will allow the fires to become heavy, so that the gases rise



PLANS OF A BELLEVILLE WATER TUBE BOILER FITTED WITH ECONOMIZERS.

until they meet air and then catch fire, causing hot stacks. You will notice by these plans that over the boiler and under the economizer a jet of air is introduced. This jet ignites the gases and the economizer absorbs the heat of gases that would otherwise pass out of the stacks. Economizers are used on all the Belleville boilers now building, but none of the boilers in this country are fitted with them as yet."

For Propeller Repairs.

Editor Marine Review:—Referring to the article in your last issue, "Removing a Broken Propeller Blade," I would say that this work was done by means of a propeller dam, which I designed in 1888 for the American line. This dam is placed around the propeller, the water pumped out, and then the propeller is ready for repairs or renewal. One of these dams fits all the propellers on the four large steamers of the American line, and may be applied while the ship is loading or discharging, so that work may proceed without moving the vessel or interfering with regular business in port. An improved form of this device was fully illustrated and described in the Marine Journal of New York, issue of May 20, 1893.

Philadelphia, April 25, 1898.

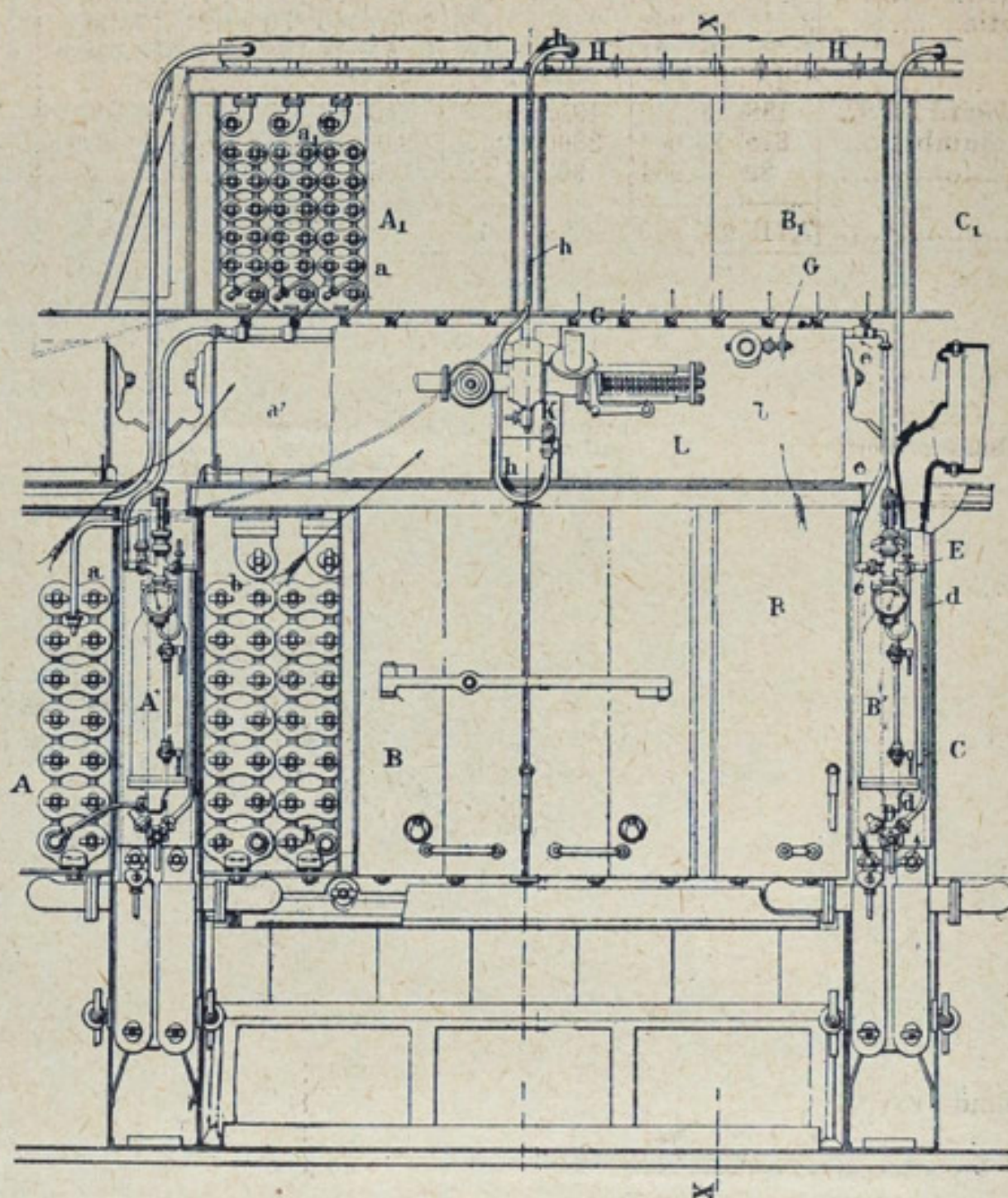
JOHN HAUG.

"In All the World No Trip Like This" is the striking title of an artistic brochure just issued by the Northern Steamship Co., and which contains a charming description of the North West and North Land, and the delightful experiences of the author, the scenery and the places seen on a round trip of one of the boats last season. It is handsomely printed on heavy calendared paper, and is profusely and artistically illustrated with half-tone engravings of the principal places along the route.

J. E. Mills and others of Port Huron have sold the barge Montgomery to the Port Clinton Lumber Co. for \$4,250 cash.

Canal Work Entirely Suspended.

It is officially announced from Albany that the Erie canal will be opened May 7, at noon, and in this connection comes announcement also of peremptory orders for the immediate cessation of all work of improving New York state canals under the \$9,000,000 bill. It follows, therefore, that for another year at least there is to be no progress in the matter of Erie canal enlargement, so important to the people of New York and to the extensive grain and flour interests of the lakes. The \$9,000,000 provided for by the law of 1895 for deepening the three canals by 2 feet, or to make the Erie and Oswego canals 9 feet deep, and the Champlain 7 feet deep, has all been spent. By the end of the present month not a dollar of the \$9,000,000 will be left. In fact, if the amount expended is not a couple of hundred thousand in excess of the appropriation, before every portion of the work is closed up, it will be because all work is abandoned as the order to stop finds it. Some contracts are of a character that must be completed in order to preserve the work already done. This applies to walls partially built, which, if left undone, would topple into the canal and have to be done all over again. It is probable that all work of this character will be closed up by the superintendent of public works out of the extraordinary contingency fund in such a manner as not to involve the state in loss. Excavating of every kind will immediately cease. There will be no work done on any of the contracts, except such as have been indicated, during the season of navigation, or at any other time until there has been a new appropriation of money authorized



by the state legislature. Seven millions more will be required to complete the entire improvements. The commission appointed by Gov. Black of New York to investigate expenditures made under the canal improvement law has been at work for several weeks past, but will not be prepared to make a report for some time to come.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store in regular elevators at the principal points of accumulation on the lakes. April 23, 1898:

	Wheat, bushels.	Corn, bushels.
Chicago	3,904,000	13,959,000
Duluth	3,230,000	3,137,000
Milwaukee	106,000	
Detroit	35,000	197,000
Toledo	369,000	958,000
Buffalo	677,000	1,062,000
	8,321,000	19,313,000

As compared with a week ago, the above figures show, at the several points named, a decrease of 1,658,000 bushels of wheat and 2,207,000 bushels of corn.

There will be no change in superintendents of coal docks at the head of Lake Superior this season. The men in charge are: C. P. White of the Youghiogheny & Lehigh; Benjamin Finch of the Lehigh Coal & Coke Co.; R. W. Wright of the Ohio Coal Co.; Robert B. Patton of the Philadelphia & Reading Coal Co.; J. W. Barnes of the Lehigh Valley Coal Co.; James Batton of the St. Paul & Western; W. P. Barrett of the Northwestern Coal Ry. Co.; A. E. Botsford of the Pioneer Fuel Co.; J. J. Johnson of the Pennsylvania & Ohio Co., and A. C. Jones of the North Western Fuel Co.

Canada's Merchant Shipping.

Canada's merchant shipping has been declining at the rate of 10,000 to 50,000 tons a year for about twenty years past. The latest report of the department of marine and fisheries available at this time (June 1, 1898,) is dated Dec. 31, 1896. This report shows that the total number of vessels owned in Canada on Dec. 31, 1896, including old and new vessels, sailing vessels, steamers and barges, was 7,279, measuring 789,299 tons, register tonnage, being an increase of seventeen vessels and a decrease of 36,537 tons register, as compared with 1895. The number of steamers on the registry books on the same date was 1,762, with a gross tonnage of 251,176 tons. Assuming the average value to be \$30 per ton, the value of the registered tonnage of Canada, on Dec. 31, 1896, would be \$23,678,970. The number of new vessels built and registered in the Dominion during 1896 was 227, measuring 16,146 tons, register tonnage. Estimating the value of the new tonnage at \$45 per ton, it gives a total value of \$726,570 for new vessels.

VESSELS ON REGISTRY BOOKS OF DOMINION OF CANADA.

PROVINCES.	Dec. 31, 1893.		Dec. 31, 1894.		Dec. 31, 1895.		Dec. 31, 1896.	
	Number of vessels.	Registered or net tonnage.	Number of vessels.	Registered or net tonnage.	Number of vessels.	Registered or net tonnage.	Number of vessels.	Registered or net tonnage.
New Brunswick.....	1,010	156,086	1,003	136,257	975	122,417	964	115,506
Nova Scotia.....	2,715	396,263	2,710	371,432	2,683	343,356	2,669	317,526
Quebec.....	1,426	161,121	1,427	160,590	1,454	158,776	1,469	158,649
Ontario.....	1,370	146,665	1,480	148,525	1,508	148,669	1,525	146,522
Prince Edward Isl'd...	188	20,970	191	19,650	190	19,323	174	16,540
British Columbia.....	315	24,900	336	26,455	346	25,988	363	26,622
Manitoba.....	89	6,534	98	6,715	106	7,307	115	
Total.....	7,113	912,539	7,245	869,624	7,262	825,836	7,279	789,299

Practically all the Canadian vessels engaged in lake trade are owned in Ontario. The following table will therefore prove interesting as a summary of the Canadian fleet on the great lakes. The date of preparation of this table is also Dec. 31, 1896:

Name of Port.	Total number of sailing ships and steamers.	Number of steamers.	Gross tonnage of steamers.	Total net tonnage of sailing ships and steamers.
Amherstburg	2	...		121
Belleville	20	13	556	893
Bowmanville	4	...		752
Brockville	29	27	391	432
Chatham	28	17	873	1,511
Chippewa	3	...	263	153
Cobourg	4	1	15	311
Collingwood	66	64	7,188	5,338
Cornwall	2	2	172	109
Cramahe	2	...		278
Deseronto	18	13	1,383	1,387
Dunnville	2	2	204	122
Goderich	42	25	689	1,813
Hamilton	49	37	4,820	4,741
Kingston	197	78	11,606	26,539
Morrisburg	3	...		382
Napanee	3	...		409
Oakville	4	...		295
Ottawa	324	179	13,962	25,958
Owen Sound	33	31	5,881	4,279
Picton	32	11	1,383	3,330
Port Arthur	7	7	2,863	1,845
Port Burwell	11	4	41	890
Port Colborne	6	2	95	681
Port Dover	18	6	170	976
Port Hope	63	37	3,032	5,992
Port Rowan	4	1	168	351
Port Stanley	12	10	1,311	1,097
Prescott	29	15	1,011	4,078
Sarnia	29	21	8,391	7,091
Saugeen	9	9	388	266
Sault Ste. Marie	15	12	477	851
St. Catharines	126	57	8,197	18,509
Toronto	242	165	15,869	16,829
Wallaceburg	31	17	1,058	2,024
Whitby	3	...		514
Windsor	53	27	6,218	5,375
Total	1,525	892	98,665	146,522

Life boats of the new steamer Georgia of the Goodrich line, Chicago, are to be equipped with releasing hooks of the kind made by the Standard Automatic Releasing Hook Co., No. 22 State street, New York. The Goodrich company now has the boats of all their steamers equipped with this device, which shows that they regard the safety of their patrons as of first importance, and with this end in view provide their vessels with the latest and best safeguards for life in time of danger. Orders have also been received for hooks of this kind to be applied to the boats of the two revenue cutters building in Cleveland. In accordance with an order from the bureau of construction and repair, navy department, tests of this device were conducted by a board of naval officers on the U. S. S. Annapolis, and their report to the department was highly favorable, the hook being found to fulfill all requirements.

The L. P. & J. A. Smith Co., dredging and public works contractors, have removed their Cleveland offices to the Perry-Payne building, eighth floor.

Ships Purchased by the Government.

The last issue of the Review contained a partial list of ships purchased by the government for auxiliary naval purposes. Additional purchases of vessels, especially steam yachts and large tugs, are reported daily from Washington. Naval officers give out little information regarding the purchases, but another partial list, prepared from various sources, is as follows:

Old Dominion liner Yorktown, a steamer of 2,200 tons, to be fitted out as a cruiser and renamed Resolute.

Steamer Venezuela of Red D line, to be refitted as auxiliary cruiser and renamed Panther; also steamer Yumuri of Ward line, rechristened Badger.

Menemsha of Hogan line, formerly plying between Boston and Galveston; has been sent to Norfolk navy yard to be converted into an auxiliary cruiser.

Hamburg-American steamers Fuerst Bismarck and Hamburg; transatlantic liners of large tonnage, to be made auxiliary cruisers.

British steamer Regulus; to be taken from St. Johns, N. F., and to be used as a coal carrier.

Newfoundland coasting steamer Grand Lake; a vessel of composite build, and of 12 knots speed; will probably be converted into a gunboat.

New steam pilot boat Philadelphia, built last year at works of Neafie & Levy, Philadelphia; 134 feet long; 750 horse power.

Tug Thomas P. Flower, formerly owned by Cornell Steamboat Co.; 100 feet over all and of about 250 tons burden.

Tugs Vigilant and Fearless of Pacific coast; both high powered, ocean-going tugs.

Tug Alice, purchased in New York but now at Norfolk. This vessel will be used as a supply ship for vessels composing the flying squadron, so long as they remain at Hampton roads.

Yacht Corsair, from J. Pierpont Morgan of New York; Corsair was flagship of New York Yacht Club; length, 241 feet; displacement, 500 tons; speed, 19 knots.

Yacht Aileen, from Richard Stevens of Hoboken; 135 feet over all; displacement, 151 tons; speed, about 16 knots.

Yacht Vergana, from Frederick H. Benedict of New York; 105 feet long; built in 1897.

Yacht Penelope, from H. E. Converse of Boston; built in 1893; 541 tons displacement; 218 feet over all.

Tug Albert W. Booth, from M. Moran of New York; vessel now nearing completion at yard of Neafie & Levy, Philadelphia.

Yacht Thespia, from David Dows, Jr., New York; 312 tons gross, 170 net; length over all, 194 feet; on water line, 169; beam, 23.3; draught, 9.10.

Yacht Restless, from Hiram W. Sibley, Rochester, N. Y.; 104.87 tons gross, 52.44 net; length over all, 132 feet; on water line, 115 feet; beam, 16 feet; draught, 7 feet.

Yacht Illawari, from Eugene Tompkins, Boston; 118.90 tons gross, 38.85 net; length over all, 129.10 feet; on water line, 106.3; beam, 18.6; draught, 8.2 feet.

Yacht Viking, from H. A. Hutchins, New York; 141.38 tons gross, 71.39 net; length over all, 138.6 feet; on water line, 122; beam, 21; draught, 9 feet.

Yacht Hiawatha, from Charles Fleischmann, Cincinnati, O.; length over all, 170 feet; on water line, 138; beam, 21; draught, 8 feet.

Yacht Ituna from A. V. Armour, New York; 171.53 tons gross, 98.45 net; length over all, 150 feet; on water line, 135.6; beam, 19.7; draught 10.9 feet.

Yacht Au Revoir, from William Du Pont, Wilmington, Del.; 342.06 tons gross, 212 net; length over all, 181 feet; on water line, 150; beam, 23.6; draught, 8 feet.

It is also understood that the tugs Active of San Francisco, C. C. Coyle of New Orleans and Penrose of Mobile are among vessels purchased. Among vessels said to have been recommended for purchase are the steamers Howard, Gloucester and Fairfax of the Merchants' & Miners' Transportation Co., each of 3,000 tons; four tugs of the Puget Sound Tug Boat Co.'s fleet, including the Tacoma, Holyoke, Tyee and Pioneer; yacht Comanche, owned by H. M. Hanna, Cleveland; tugs Honeybrook and Plymouth; passenger steamers Vigilant and Laura A. Darragh, owned by Thomas Marvel & Co., Newburg, N. Y.

East-Bound Shipments from Chicago.

During six years past lake vessels have carried in the navigation season (May to November, inclusive,) an average of 59.9 per cent. of all freight moved eastward from Chicago. In the following table the business of ten trunk lines running eastward from Chicago is compared with business taken out of that city by lake vessels:

SEASON OF	Moved by lake.		Moved by rail.		Total Net tons.
	Amount. Net tons.	Per cent.	Amount. Net tons.	Per cent.	
1897.....	4,047,521	66.3	2,057,319	33.7	6,104,840
1896.....	3,272,115	61.7	2,029,160	38.3	5,302,115
1895.....	928,001	33.7	1,817,642	66.3	2,745,643
1894.....	570,584	62	348,333	38	918,917
1893.....	3,187,622	63.3	1,846,128	36.7	5,033,750
1892.....	3,052,014	58.7	2,145,180	41.3	5,197,194

* From Chicago Board of Trade reports.

It is understood that Barry Bros. of Chicago paid \$40,000 for the two powerful tugs, Prodigy and G. A. Tomlinson, which are their property outright as a result of the arrangement by which they give up Duluth business and enter into harbor towing at South Chicago. The two big tugs will be kept at South Chicago regularly, and whenever it is necessary they will be assisted by a tug or two from the Barry fleet in Chicago, which numbers ten modern tugs. The South Chicago office of the line will be at Ninety-second street bridge.



DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

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The books of the United States treasury department on June 30, 1897, contained the names of 3,230 vessels, of 1,410,102.60 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1897, was 399, and their aggregate gross tonnage 769,366.68; the number of vessels of this class owned in all other parts of the country on the same date was 314, and their tonnage 685,709.07, so that more than half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1897, was as follows.

	Number.	Gross Tonnage.
Steam vessels	1,775	777,235.45
Sailing vessels and barges.....	1,094	694,888.87
Canal boats	361	37,978.28
Total	3,230	1,410,102.60

The gross registered tonnage of the vessels built on the lakes during the past five years, according to the reports of the United States commissioners of navigation, is as follows:

Year ending June 30, 1893.....	175	99,271.24
" " " 1894.....	106	41,984.61
" " " 1895.....	93	36,352.70
" " " 1896.....	117	108,782.38
" " " 1897.....	120	116,936.98
Total	611	403,327.91

ST. MARY'S FALLS AND SUZ CANAL TRAFFIC. (From Official Reports of Canal Officers.)

	St. Mary's Falls Canals.			Suez Canal.		
	1897	1896	1895	1897	1896	1895
Number of vessel passages.....	17,171	18,615	17,956	2,986	3,409	3,434
Tonnage, net registered.....	17,619,933	17,249,418	16,806,781	7,899,374	8,500,284	8,448,383
Days of navigation.....	234	232	231	365	365	365

That was a brilliant idea, that of carrying an army of invasion to Cuba aboard men-of-war. The man who proposed that scheme must have traveled on warships all his life, and therefore knew just where the horses and ambulances and wagon train of an army would be stowed—not to speak of the soldiers. They could lie on the spar decks and take the rain or sunshine just as Heaven chooses to distribute them. If an enemy's fleet happened to come along, and it became necessary to clear decks for action, the soldiers could be thrown overboard along with the chemical chests, or buoyed out in the ship's boats. The wagon train could be stowed in the ship's galley, or in the sick bay, or the paymaster's clerk's room, or in the captain's cabin, and the ambulances could be hoisted up to the signal yards out of the way. And if it chanced that the fleet had to stay out over night the soldiers could sleep in the sailors' hammocks and the crew march to the tune of "All Hands and the Cook" for twenty-four hours at a stretch. There are some people in this country who know quite enough in times of peace, but altogether too much in time of war.—Times, New York.

Commodore Hichborn, chief naval constructor, has issued a statement showing the percentage of completion of the various boats now being built for the navy. The battleships Kearsarge and Kentucky at Newport News are completed to the extent of 57 per cent.; the Illinois, at Newport News, 75 per cent.; the Alabama, under construction by Cramp & Sons, 46 per cent., and the Wisconsin, at the Union Iron Works, 35½ per cent. The gunboat Princeton, under construction by Dialogue & Son, is 95 per cent. completed, and the submarine torpedo boat Plunger, building at the Columbia Iron Works, 70 per cent. The torpedo boat Rowan is completed to the extent of 94 per cent.; the Davis, 78 per cent.; the Morris, 87 per cent.; the McKenzie, 92 per cent.; the McKee, 80 per cent.; the Farragut, 60 per cent.; the Fox, 73 per cent.; the Craven, 38 per cent., and the Stringham, 15 per cent.

The annual report of the directors of the Cunard Steamship Co. shows that despite the fact that there was a great falling off in passenger business in the past year the earnings were sufficient to permit of the payment of a dividend of \$200,000, which is 2½ per cent. on the paid up capital of the company. The sum of \$830,000 was deducted from the gross earnings for depreciation in value of the vessels of the company and for wharf property, and \$140,000 was credited to the company's insurance fund. The Cunard company now has thirty-one vessels of 119,215 gross tons and 149,953 effective horse power. One vessel of 3,300 tons and 1,800 horse power is under construction. Two of the steamers of this line are above 12,000 tons, two above 8,000 tons, two above 7,000 tons, four above 5,000 tons, three above 4,000 tons, and eight above 2,000 tons.

The largest floating grain elevator ever constructed has just been delivered to the International Elevator Co. of New York by the builders, John A. Dialogue & Sons of Camden, N. J. It has been placed in the Erie basin, Brooklyn, and will be used to deliver grain into the large ocean steamers. The hull, decks and towers are entirely of steel, which is a decided departure from the usual method of constructing elevators. The tower is 85 feet high and its capacity is 12,000 bushels of grain an hour. The hull is fitted up with a single screw propeller of 350 horse power. An engine of 250 horse power is used for the elevator, and its

mill machinery, which is now being adjusted, is of the latest and best type. The elevator is named Isis. A duplicate structure, also for service in New York harbor, is being built by the same firm.

If war with Spain is to be continued for any great length of time, it is probable that the three naval officers in charge of light-house affairs on the lakes, who are stationed at Buffalo, Detroit and Chicago, will be called to sea duty. These officers are more liable to be removed from the lakes than the army officers who are in charge of river and harbor improvements. In event of this change, it is probable that the three lake light-house districts—ninth, tenth and eleventh—would be placed under the direction of one officer with civilian assistants. Such a change would be welcomed by lake vessels, in so far as the consolidation of districts is concerned, as they have held for some time past that the entire lake light-house service should be under the direction of one supervising officer.

A grain elevator with a capacity of 1,500,000 bushels has recently been completed at Manchester, England, by a Chicago contractor. The machinery and all the iron work in this building were produced in Chicago. The United States also furnished the pine and the heavy timber used in the building, and all the skilled laborers, foremen and superintendents were Americans. The building, which is the largest elevator in England, was completed in four months from the time the foundations were finished. The equipment includes complete and modern loading and unloading devices and conveyors. It is estimated that the appliances in use will permit the unloading of grain from vessels at the rate of 12,000 bushels an hour.

One of the Lake Superior papers contained a note, a few days ago, saying that Capt. Cleveland of the steamer Wm. Chisholm was the oldest captain in point of service trading to Lake Superior, he having been on vessels running to that lake since the canal at Sault Ste. Marie was opened in 1855. Other old mariners are now telling of their length of service. Capt. John Parker, now living at Ontonagon, is said to have been in command of vessels on Lake Superior several years prior to the opening of the canal. Two other old navigators who died within the past few years—Capt. James Bendry of Baraga and Capt. "Jack" Angne of Bayfield—sailed with Capt. Parker before the canal was opened.

Angus Smith, who died at his home in Milwaukee Friday, aged seventy-six years, was for forty years a prominent and very active business man of that city. Acting with Jesse Hoyt of New York, he built in 1853 the first railroad warehouse and grain elevator erected in Milwaukee, and from that day to this the firm of Angus Smith & Co. has held first place in Milwaukee's grain trade. At times Mr. Smith controlled absolutely the entire elevator business of the city. He was the original owner of the Aragon iron mine, a Michigan property, which he sold not long ago, and was interested also in valuable silver mines in British Columbia. He was one of the principal traders on 'change at Milwaukee, even in old age.

There are in the United States twenty-two marine hospitals and eleven quarantine stations. The capacity of the hospitals is 3,680. The commissioned corps of medical officers comprises sixteen surgeons, thirty-two passed assistant surgeons and twenty-two assistant surgeons. Not all of these hospitals are in coast cities, but they will all be available to some extent for the care of sick and disabled soldiers and sailors during the war. Four of them are in lake cities—Chicago, Detroit, Cleveland and Evansville.

The Hamburg-American line steamers Columbia and Normannia, recently purchased by Spain, are not to be compared with the St. Louis and St. Paul, but they are not old vessels. The Normannia was built by the Fairfield company on the Clyde in 1890. She is 510 feet long, has a beam of 57 feet, a depth of 34 feet, and a tonnage of 6,000. The Columbia was built by Laird Bros., at Birkenhead, in 1889. She is 465 feet long, 55 feet beam, and 35 feet deep. Her tonnage is 7,240.

The first complete account of the negotiations conducted by Secretary Seward in Johnson's administration for the purchase from Denmark of the island of St. Thomas (an important coaling-station in the present war) is contributed to the American Monthly Review of Reviews by W. Martin Jones, a state department official under Seward, who tells in the same connection the story of the Alaska purchase. The article has special interest at this time.

Capt. Casper F. Goodrich, U. S. N., president of the War College, Newport, has perfected all arrangements for the new signal system by which quick and accurate communication can be carried on between vessels and shore stations. The entire coast line from Maine south has been divided into signal districts, nearly corresponding to the present light-house districts, with headquarters of the general superintendent in New York city.

In 1892 (year of beginning reconstruction) the North German Lloyd Steamship Co. had forty-six transatlantic steamers of 178,395 register tons and 167,850 horse power, the total cost price of which was \$23,600,000. With the completion of ships now building, the North German Lloyd will have forty-five steamers of 259,172 tons and 255,150 horse power, costing \$31,800,000.

Five grain cargoes taken out of South Chicago last week by the steamers Waldo, Senator and W. D. Rees and the steel barges Carrington and Australia, aggregated a million bushels. Ten years ago the cargoes of fifteen of the largest vessels then on the lakes would aggregate little more than a million bushels.

A lengthy "Notice to Mariners," just issued by the department of marine and fisheries, Ottawa, Canada, gives full particulars of all aids to navigation in the entrance to Parry Sound, Georgian bay.

To Organize Iron Furnace Interests.

The scheme of organization upon which an effort is being made to unite the non-Bessemer furnace interests of the United States has been fully explained since meetings were held at the Waldorf-Astoria in New York on Friday and Saturday last. The movement is of interest on the lakes on account of the large number of furnaces using lake ores that are involved in it. There are about sixty furnaces in the United States manufacturing foundry and forge iron, and \$100,000,000 of capital is engaged in the industry. Local organizations have been formed in some districts and it is now proposed to undertake, under the name "National Association of Manufacturers of Non-Bessemer Iron," certain agreements that will apply throughout the United States. The furnacemen think this may be done so as not to conflict with anti-trust laws. It was voted that the association be divided into eight districts, as follows: Tennessee and Alabama; Mahoning, Shenango Valley and Cleveland; eastern Pennsylvania and New Jersey; Buffalo district; western Pennsylvania; Virginia district; southern Ohio; Illinois and Wisconsin. The basis of voting by tonnage will be fixed by the establishment of 10,000 tons as the unit, and for each 10,000 tons produced the district shall be entitled to one vote. Other features of the plan of organization are embodied in the following resolutions, which were adopted at the New York meeting:

"That an assessment of 10 cents per gross ton be paid for the actual make of the furnaces for the month of March, 1898, and from month to

such secretary to be required to make up the aggregate of such output and sales and mail to each furnace company in that district, and also to the secretary of the national association, whose duty it shall be to consolidate the reports of the district associations for the daily information of furnace companies belonging to the national association.

Among members of the executive committee are the following: Buffalo district, C. C. Bolton of Cleveland and Archer Brown; Mahoning, Shenango valley and Cleveland, Frank Hitchcock and C. N. Schmick; southern Ohio, J. C. Clutts; Pittsburg, J. W. Friend and Jones Wisner; Chicago, W. L. Brown; Virginia, F. E. Weston and F. C. Dinniny, Jr.; Alabama, N. Baxter, Jr., and H. S. Chamberlain; eastern Pennsylvania, E. A. Cook and B. F. Fackenthal; central Pennsylvania, Jos. E. Thropp and C. H. Scott. Mr. Jones Wisner of Philadelphia presided at the New York meeting and Archer Brown recorded.

New Lock Gates.

Employees of the United States canal at Sault Ste. Marie are now engaged in overhauling the machinery and tightening the rods in the culverts of the Weitzel (smaller) lock. It was discovered this spring that extensive repairs will have to be made on the lower gates of the Weitzel lock before it will be safe to operate it. It may be decided to build a new set of gates. These gates have been used ever since the completion of the lock, in 1881, and are virtually worn out; particularly the lower ones.



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EXECUTIVE COUNCIL OF THE INSTITUTION OF NAVAL ARCHITECTS.

(From Shipping World, London.)

month thereafter, of which assessments one-half, or so much as the executive committee find necessary, be used to limit production, and the balance be placed in a general fund until this amount equals \$100,000. That this \$100,000 fund be deposited at interest in some financial institution and held to be divided pro rata per actual capacity, as a bonus or reward among the members who loyally comply with the requirements of the association, at such date as it be dissolved.

"That after the accumulation in excess of the amount needed for restriction reaches \$100,000 the amount of monthly assessments per ton shall be paid by the executive committee, but shall not exceed 10 cents per ton, unless ordered at a general meeting of the association. That the assessment orders, not otherwise provided for, be used to purchase restriction of production. The executive committee, to accomplish this purpose, will invite bids to stop from owners of active furnaces, and shall proportion the needed restriction among the lowest bidders. That any surplus over and above the bonus fund or amount needed to limit production be divided pro rata, according to actual make, among the members of the association. That an accurate account of all expenditures be kept and reported monthly to the district association, and an assessment levied to pay general office expenses."

A resolution was adopted that the inauguration of the above plan be conditioned upon, and become operative when accepted by signatures of 85 per cent. of the active productive capacity of the non-Bessemer furnaces of the United States during the month of March, 1898. It was also decided to have each furnace company send daily reports to the secretary of its district association, giving the output and shipment of pig iron, and

Some of the tie rods have pulled into the heel and toe posts; others have been broken by the strain; still others are slack and some unusually tight. With this condition of things the force of the water has caused the gates to bulge in on the upper side and bulge out on the opposite surface, making it hazardous to attempt to use them. Supt. Ripley says it would in his opinion be best to construct new gates, but does not know whether this will be done or whether the gates will be repaired. The question is now being considered by Col. Lydecker. About three weeks would be required, Mr. Ripley says, to repair the gates, and about six weeks to build new ones. Sufficient timber is on hand for the purpose, and the most of the work on the old gates could be utilized in the new ones. It is the intention to employ a portion of the Weitzel lock force in operating the Poe lock and to use the other portion in repairing the former lock and repairing or building new gates. Mr. Ripley is of the opinion that the traffic through the canal will not require the operation of the Weitzel lock for some time yet.—Sault Ste. Marie News.

An important experiment with the Holland submarine boat, a few days ago, appears to have settled the question as to the practical usefulness of this new style of vessel. On that occasion the boat dived and ran for a distance variously stated as a mile and a mile and a half under water.

A complete stock of lake charts is on hand at all times in the office of the Marine Review, 409 Perry-Payne building, Cleveland. The list includes British admiralty charts, United States hydrographic office charts, and the charts made by the United States engineers.

Around the Lakes.

Welland canal tug owners have entered into association agreements similar to those of last year. They announce a reduction of 1 cent a ton in towing rates.

Capt. James Davidson launched the wooden steamer Amazonas at his West Bay City yard Saturday. She is 315 feet long, 44 feet beam and 26 feet depth.

Saturday night trips between Cleveland and Detroit will be resumed after May 1 by the Detroit and Cleveland Navigation Co. The fare for the round trip is \$2.

Machinery of the old Chicago steamer John A. Dix is to be placed in the new steamer to be built by the Detroit Dry Dock Co. for passenger service between Erie and Buffalo.

The Craig Ship Building Co. of Toledo has delivered at Buffalo the new steamer John M. Wilson, which is to be used as a tender by United States Engineer Major Symons and his assistants.

Capt. Charles H. Westcott of St. Clair, Mich., has been reappointed to the position of supervising inspector of steam vessels in the eighth district, which he held under the Harrison administration.

The schooner Manitou, owned by Sidney Adams of Marquette, has been purchased by Capt. William Quinland of Detroit. She will be repaired at Port Huron and employed in the lumber trade.

New Orleans owners of the ocean tug Wilmot, recently sold to the government, have secured figures from several lake ship builders on a tug to take the place of the Wilmot, and will probably let a contract within a few days.

The Escanaba Towing & Wrecking Co. has secured a verdict of \$750 against J. M. Jones for services rendered to the schooner John Magee in 1895. The vessel had sprung a leak and required the services of a tug and steam pump.

With one leg the new Export elevator at Buffalo on Tuesday last unloaded 305,000 bushels of grain from the steamer Crescent City in twenty-four hours' continuous work. This is better than some of the old-style elevators can do with three legs.

Annual reports are not published by the Minnesota Iron Co., but the figures which have been made up for directors show that earnings in 1897 were very much in excess of 6 per cent. on the stock, and there is no question of the payment of that rate quarterly, at least for this year. For 1898 sales are largely in excess of any on record at this time of the year.

The steel spar deck of the steamer Manchester is nearly all down, and she will probably go into commission by the close of the present week. Those who are capable of judging credit the Milwaukee Dry Dock Co. with a fine piece of workmanship. The plating of the center courses is $\frac{3}{8}$ of an inch thick, and of the courses at the sides $\frac{5}{8}$ of an inch thick.—Milwaukee Evening Wisconsin.

Promoters of the latest Detroit river bridge scheme found little difficulty in securing permission from the Canadian parliament to build a bridge of the kind proposed in the bill pending before the United States congress. The Grand Trunk, Wabash and Michigan Central railway companies are interested in the Canadian corporation, which will be known as the Windsor & Detroit Union Bridge Co. A point raised in the Canadian parliament was that the Canada Southern Ry. had already been granted a charter for the same purpose, and that if a second charter were issued it would arouse such opposition from the Lake Carriers' Association as to destroy both schemes. Mr. Bell, replying on behalf of the Grand Trunk, said that the Canada Southern had failed in its original idea of building a tunnel and had not succeeded in its later purpose of spanning the river with a bridge. The Grand Trunk, the Wabash and Michigan Central were in earnest and were confident that they would get the necessary powers from the United States authorities to carry out the undertaking. Mr. Bell gave an assurance that, if permitted to charge reasonable tolls, a foot way for passengers would be provided on the bridge.

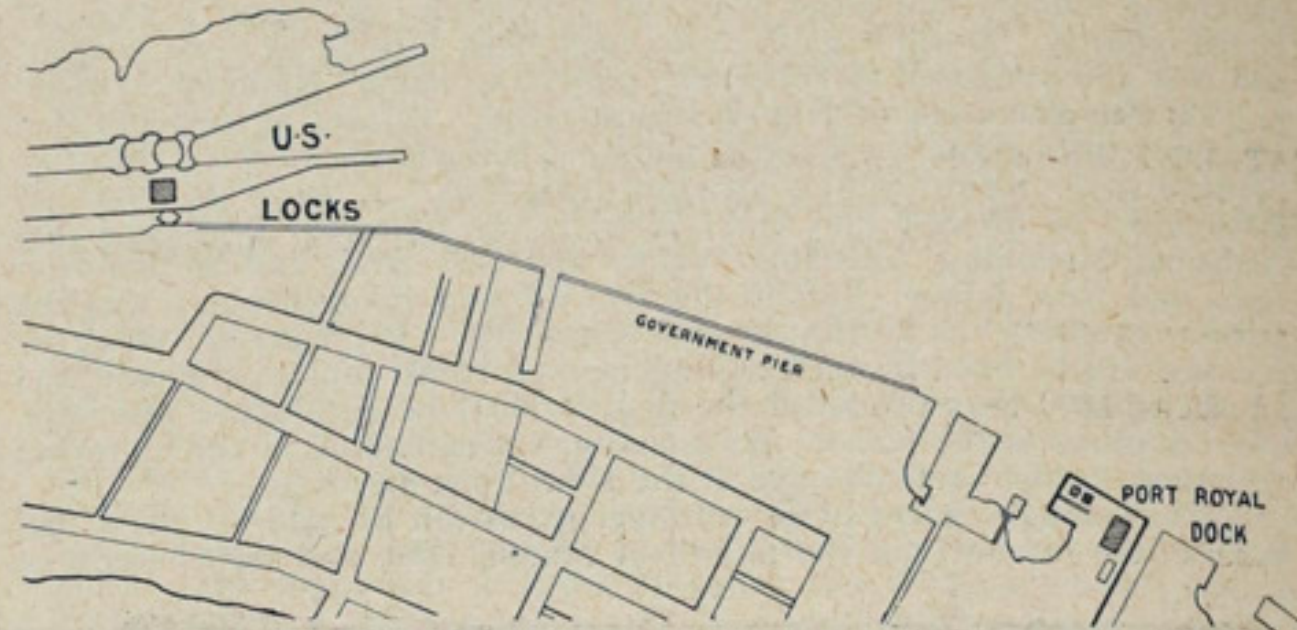
Large Order for Boiler Tubes.

The United States navy has given out an unusually large contract for boiler tubes. It includes, it is said, a full set of tubes for the U. S. S. Iowa, Brooklyn, Cincinnati and Bennington, and a partial set for the Texas. The contract calls for seamless, cold-drawn steel tubes of $2\frac{1}{4}$ inches diameter and 9 gauge, to be upset on one end. Some question may be raised as to why the government has ceased to favor the charcoal iron welded tube, and changed their Scotch boiler specifications so that the steel tube is put on a favorable footing for competing with the old style tube. The results obtained by the use of drawn seamless tubing in Thornycroft and Yarrow water tube boilers, where the requirements are so severe, have been very flattering to the new tube, and besides, their strength, durability and efficiency, they have the advantage of not pitting, and, on account of their smoothness, are much more easily cleaned. Nearly all the torpedo boats built or building have this seamless tubing in their boilers. In fact, the requirements for torpedo boats necessitated an improvement in tube manufacture, the old tube not being equal to the best practice in the construction of these vessels. It is understood that this order was given to the Shelby Steel Tube Co., and is to be filled in sixty days.

Gross earnings of the General Electric Co. for the past year, as shown by the annual report issued a few days ago, aggregated \$12,524,938.07. The expenses were \$10,727,692.02. Other expenditures amounted to \$621,849.49. The sum of \$1,231,852.37 was applied to the reduction of the deficit of previous years. The estimated cost of a new foundry and machine shop, for which plans were prepared recently, is \$500,000. Referring to the question of reducing the company's share capital, the report states that it is hoped that a plan will be submitted at an early date which will provide for the resumption of dividends. The report also says that the United States navy is adopting the electrical drive in place of steam or hydraulic machinery for ventilating, pumping and hoisting on ship-board and for lowering and elevating guns and turning turrets on warships.

New Fuel Dock at the Sault.

Below is an illustration showing the location of a new fuel dock at Sault Ste. Marie, Mich. It is located a short distance below the government locks, and is convenient for vessels bound up or down the river. It has 300 feet frontage and there is plenty of water on all sides for vessels of the deepest draft. The dock equipment consists of pockets and two McMyler derricks, one being of the latest traveling pattern with a clam-



shell bucket. This dock is operated by the Port Royal Dock Co., Paul H. McElevey, manager. Captains of down-bound steamers can telephone orders from the United States or Canadian locks. Day and night forces are maintained on the dock.

A Busy Boiler Works.

A letter from the Roberts Safety Water Tube Boiler Co., New York, says they built and shipped forty-two of their boilers in 137 working days during the past winter, and they are still working night and day. These boilers range from 10 to 600 horse power each and are used in vessels ranging from steam launches to passenger and freight steamers—upwards of 2,000 horse power being installed in one vessel. The passenger and freight steamer Sarah A. Jenks, which plies on the Hudson river between New York and Sing Sing, has had extensive alterations made in her machinery during the past winter. She formerly had a compound engine, but this has been tripled by placing a new high pressure cylinder above the former high pressure cylinder. Her two shell boilers were replaced by two Roberts boilers, each 7 feet wide and 9 feet long. The letter referring to alterations in this vessel says:

"It is said that the vessel now uses less than half the coal formerly used and makes her time with greater ease. This is a remarkable statement in regard to economy. The greatest possible difference of economy between a compound and a triple engine is about 15 per cent. Therefore, it seems as though the balance of the economy is attributable to the change in boilers. The boilers make steam with so much ease that they are run almost entirely with the dampers shut, and even then the furnace doors have to be occasionally opened in order to keep the safety valves from blowing off with the throttle wide open. This very slow combustion of coal is not generally assumed to contribute to economy, and Mr. Roberts has, therefore, suggested that an experiment be tried with only one boiler, under full natural draft, in order to give a better chemical combustion, which will probably result in still further economy, especially in view of the fact that only one fire would have to be banked at night instead of two. The Roberts boilers occupy much less space than the former boilers, and apparently weigh less than one-half the weight of the former boilers in steaming condition. The consequent decrease in the draft of the boat is also of great advantage."

The Upson-Walton Co. of Cleveland is receiving from its factory in eastern Tennessee a large assortment of newly made boat oars in all sizes. The timber in that section proves to be excellent, and this enterprising firm is to be congratulated on its success in taking advantage of the fact.

An effort is to be made shortly to recover part of the cargo of the Western line steamer Idaho, sunk last fall near Port Dover, Lake Erie. The cargo of the Idaho consisted mainly of sugar, green coffee and hardware.

NOTICE TO SHIP OWNERS AND SHIP BUILDERS.—Information furnished as to the strength of iron or steel vessels under different conditions, and the size and distribution of scantlings required in new vessels for different services, by a naval architect, who is an expert in this work. Address Box 452, Marine Review, Cleveland.

THE PORT ROYAL DOCK CO., SAULT STE. MARIE, MICH.

FUEL FOR STEAMERS.
DOCK BELOW U.S. LOCKS,
OPERATED DAY AND NIGHT.
STEAMERS FUELED PROMPTLY

DOCK EQUIPMENT
ONE TRAVELING McMYLER DERRICK
WITH CLAM-SHELL BUCKET,
ONE STATIONERY McMYLER DERRICK

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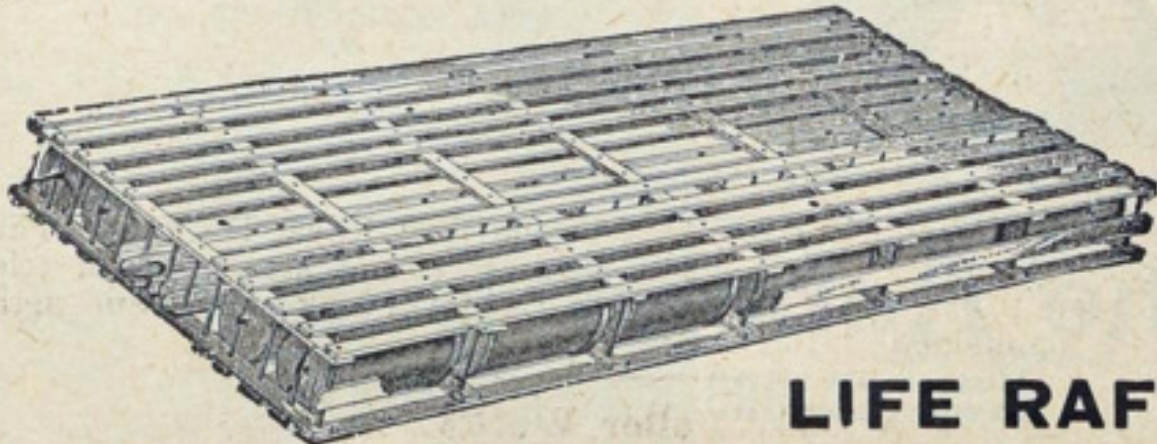
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CATALOGUES without quotations are not wanted.

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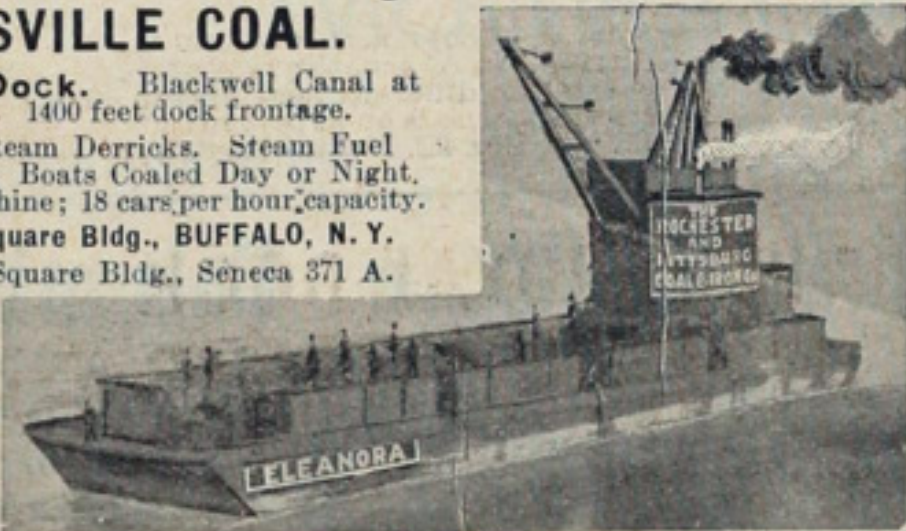
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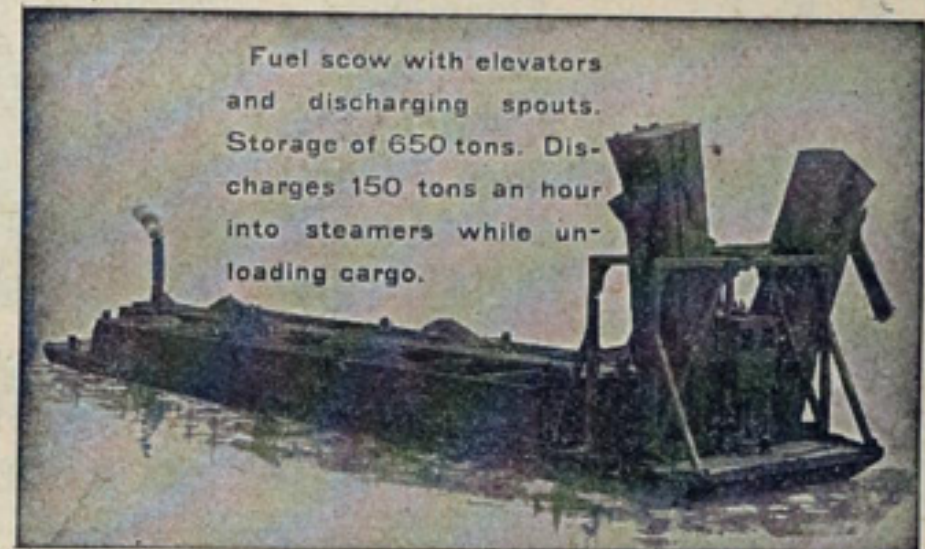
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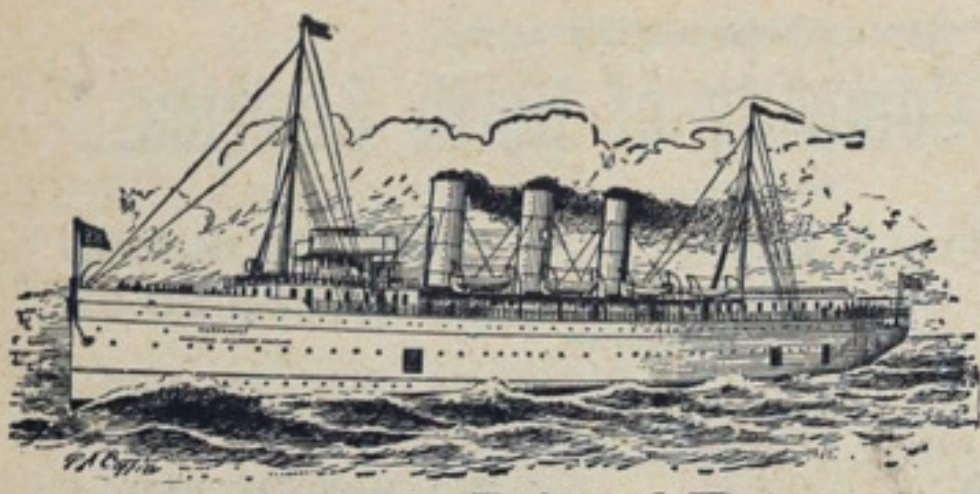
THE undersigned will receive bids up to April 30th, for the carrying of 45,000 tons of iron ore from Escanaba to Elk Rapids, deliveries to begin June 1st. Cargoes to consist of not more than an average of seven hundred and fifty tons. Depth of water at Elk Rapids fourteen feet. Bidders will name boats intended for the service. Terms free in and out, except trimming.

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For Sale—Prop. Westford, classing B1, lumber; boiler and engine A1, hull well kept up and in good condition, and consort Monitor, classing A2½, capacity 400M lumber, rebuilt in 1898, outfit and hull in good condition. Both boats are now in commission. Owners are going out of business and offer them for sale cheap.

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May 20. Eng'rs, Sec'y.



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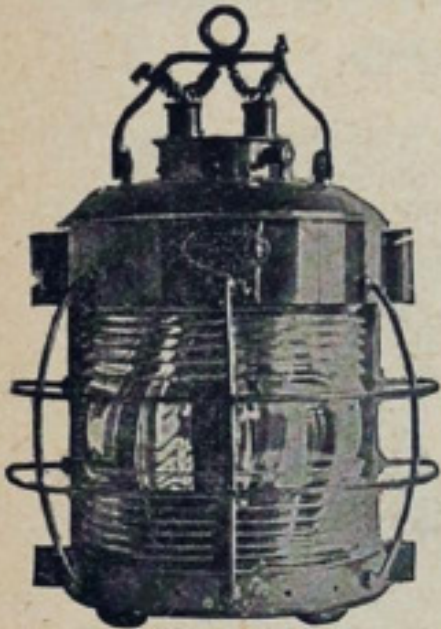
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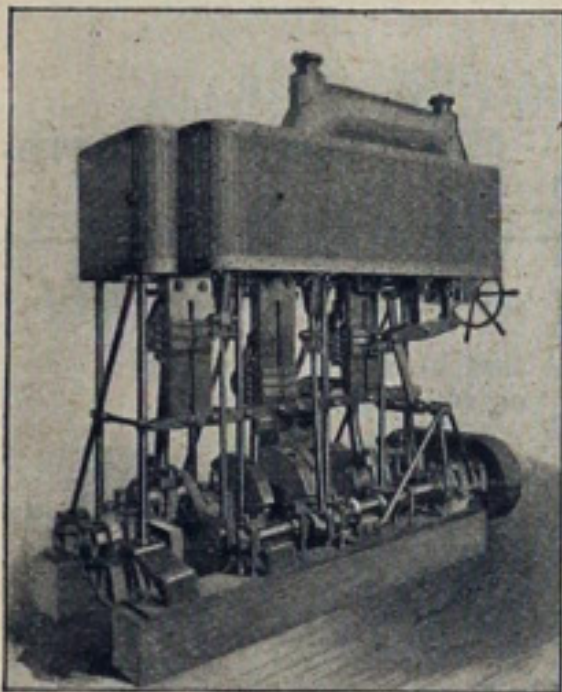
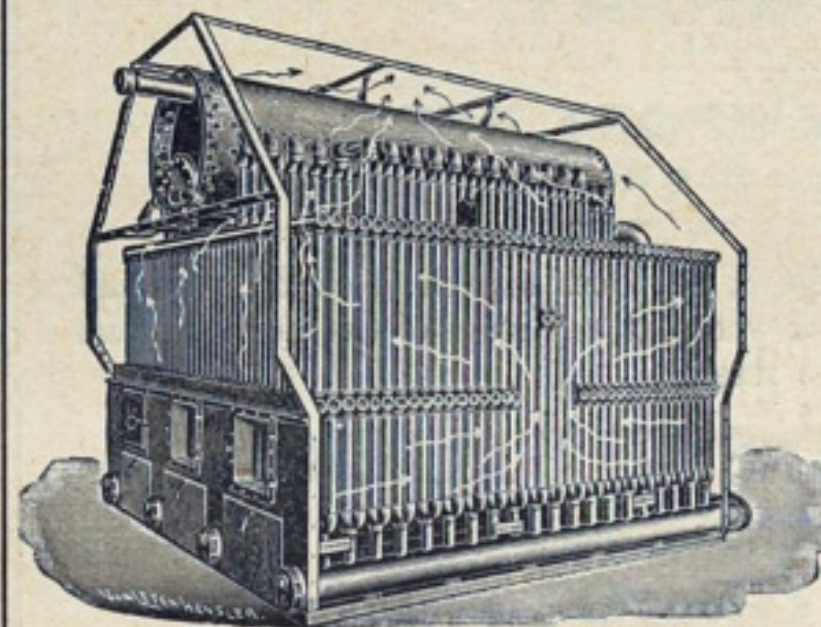
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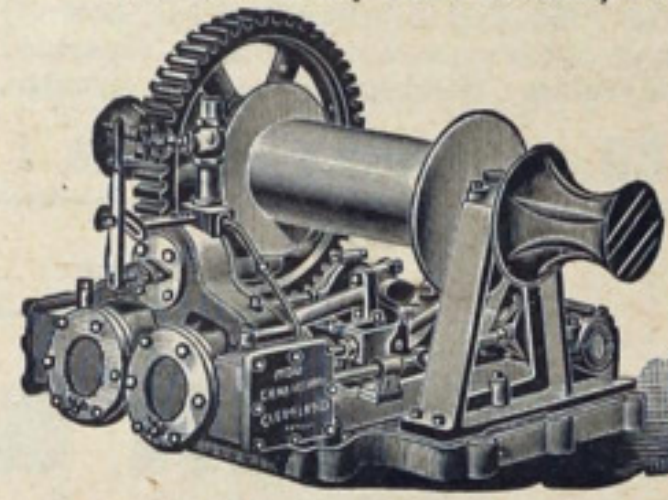
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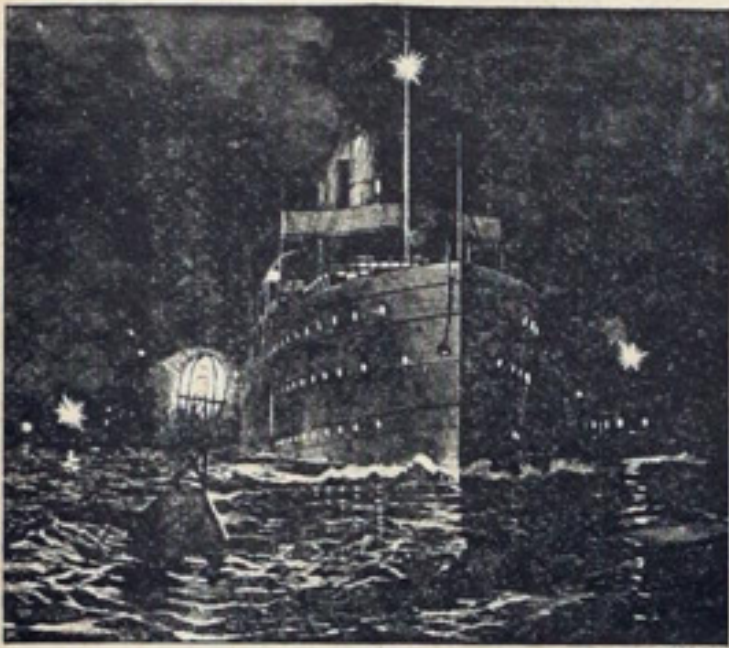
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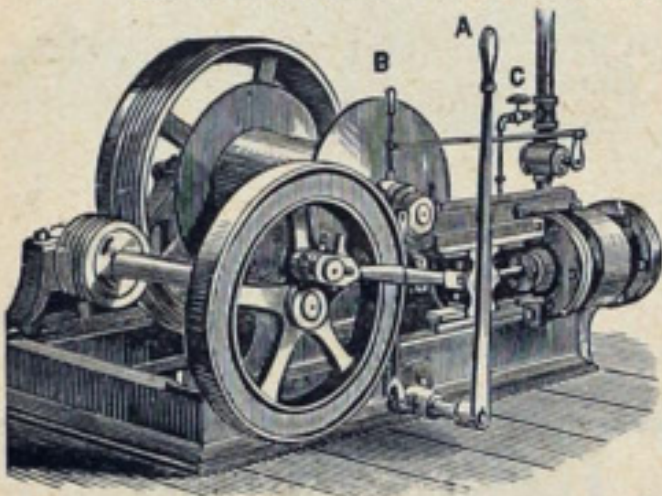
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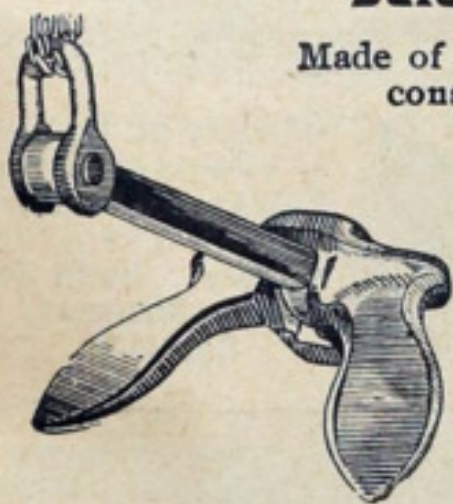
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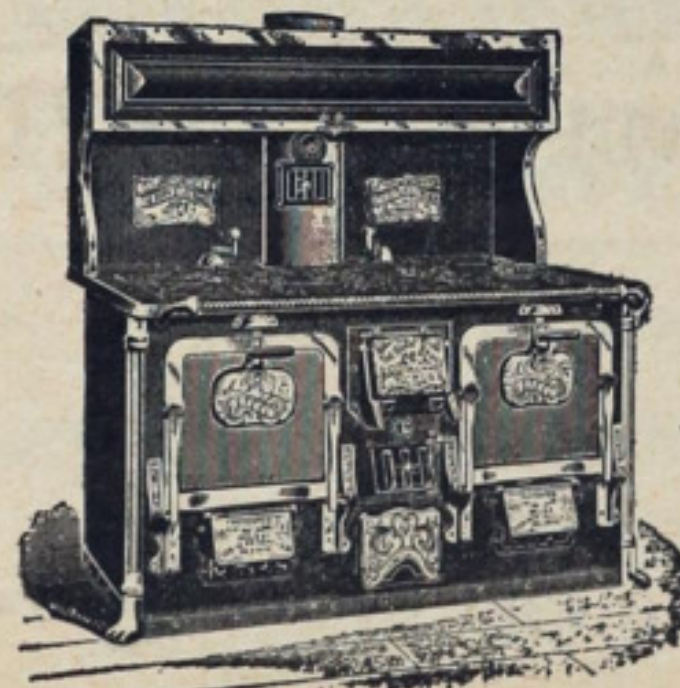
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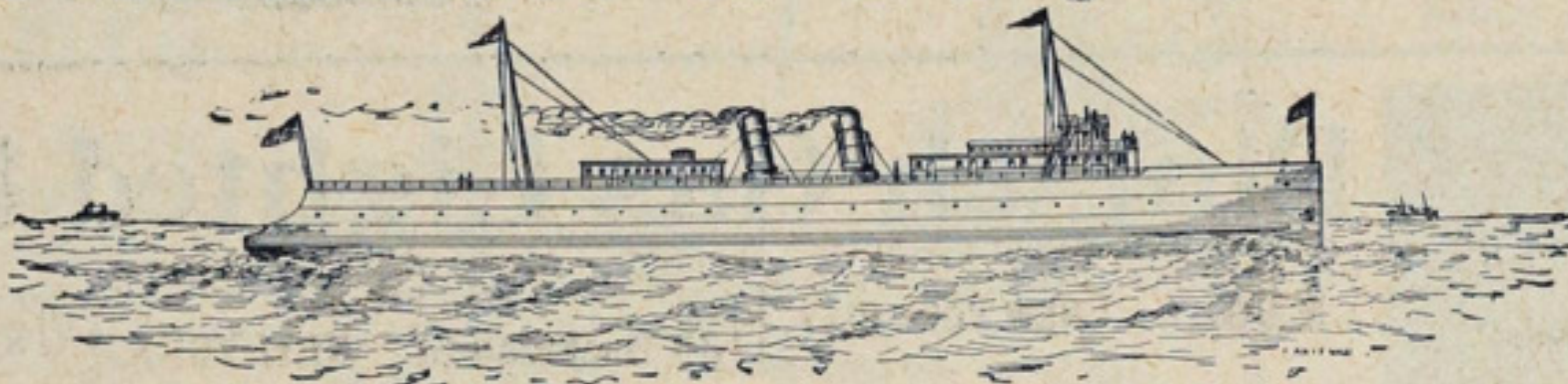
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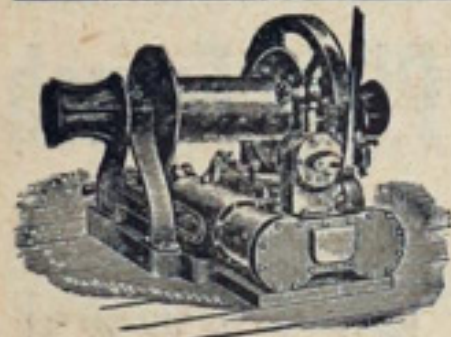
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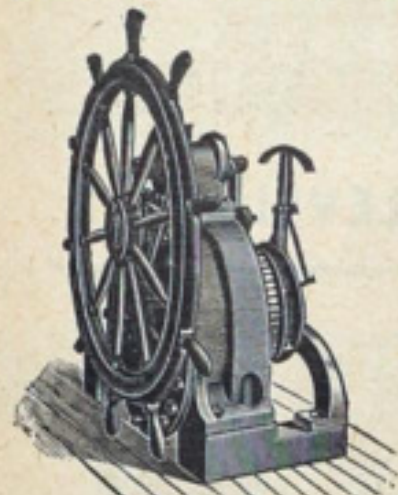
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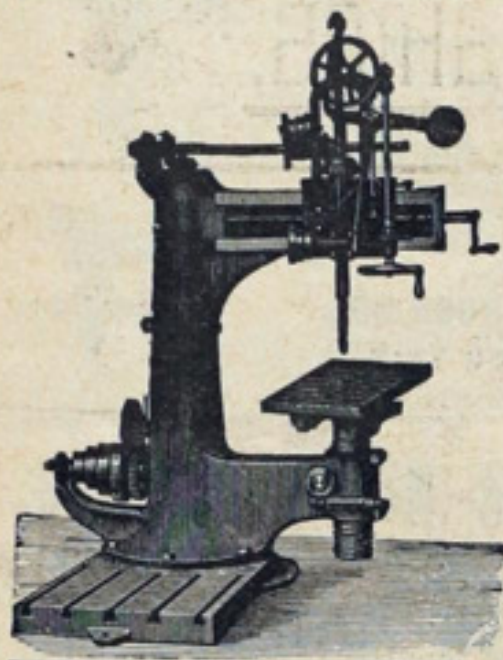
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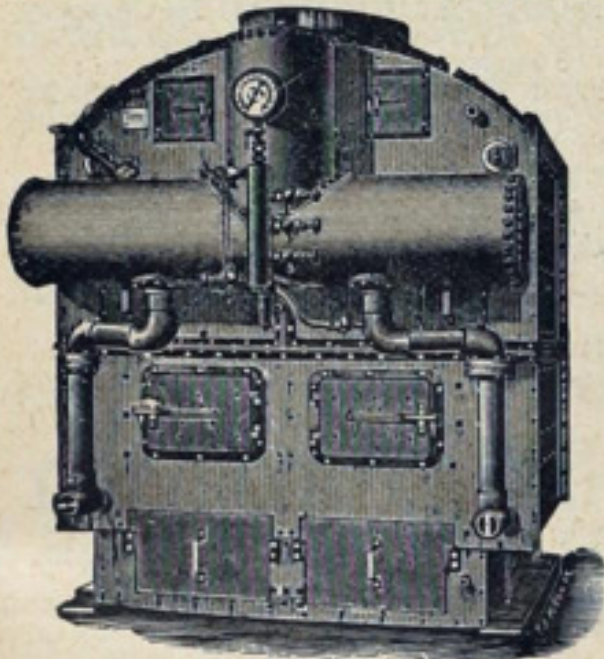
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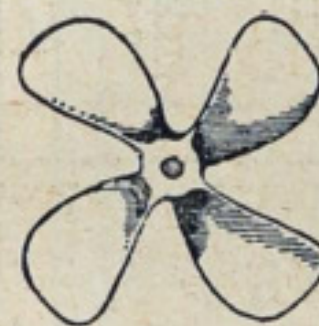
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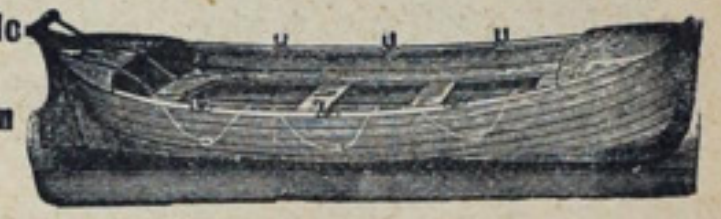
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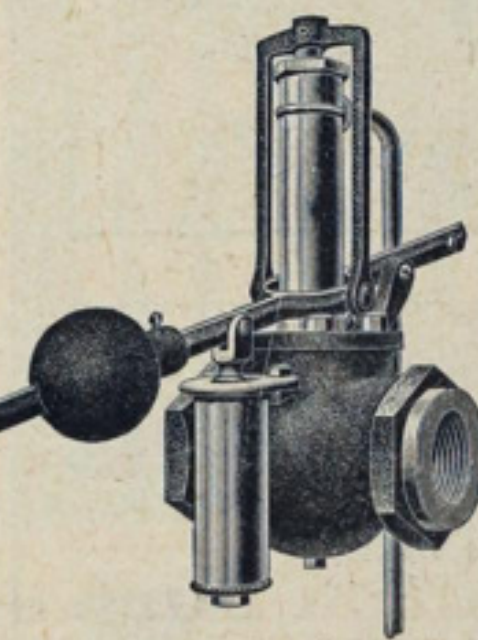
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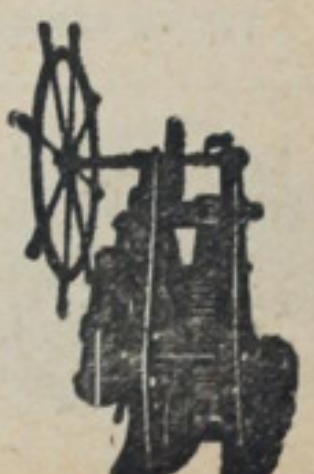
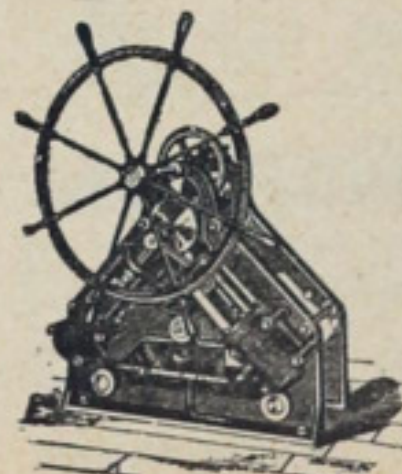
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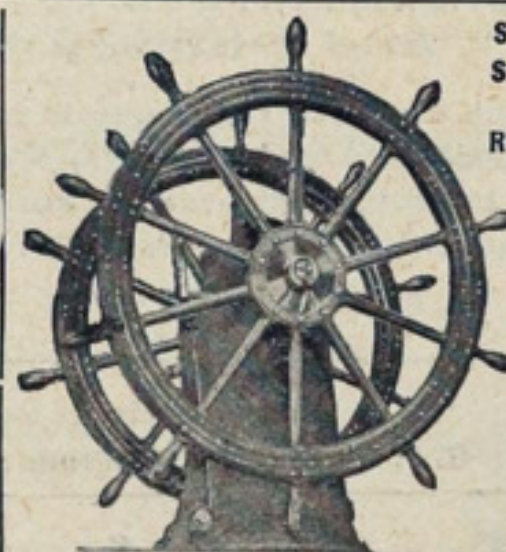


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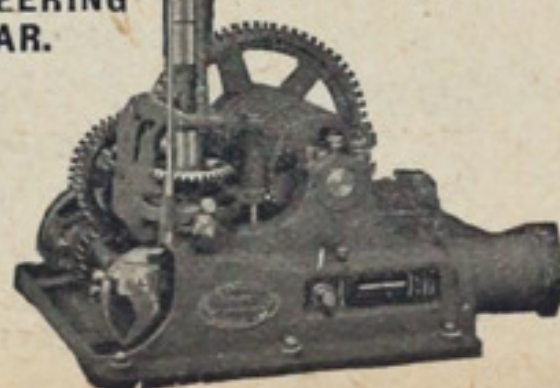


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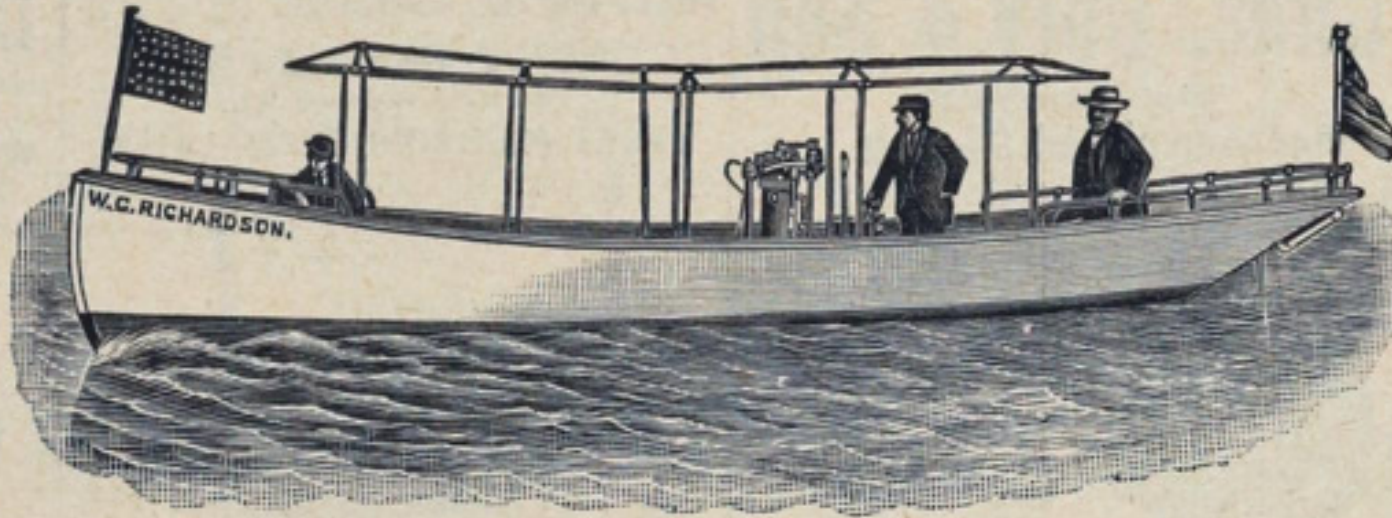


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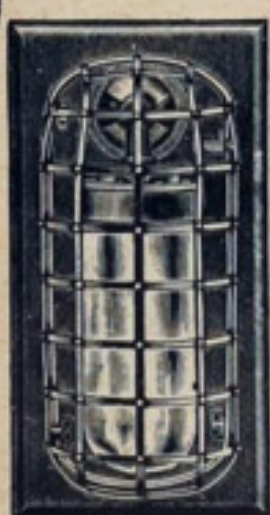
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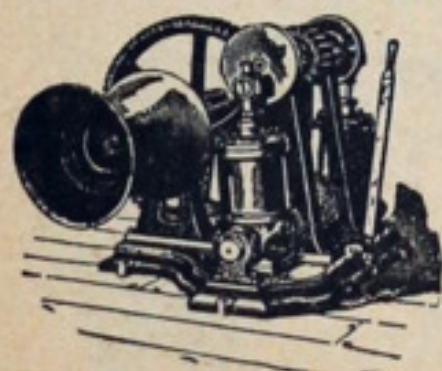
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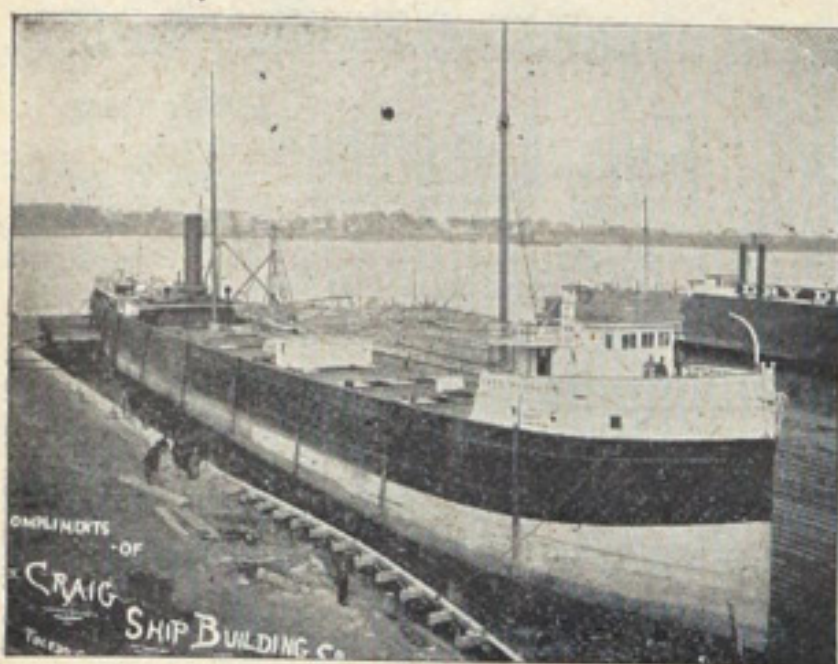
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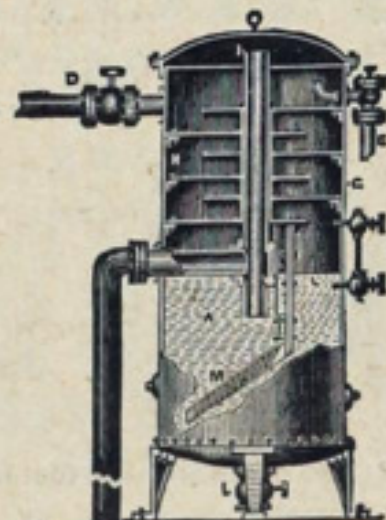
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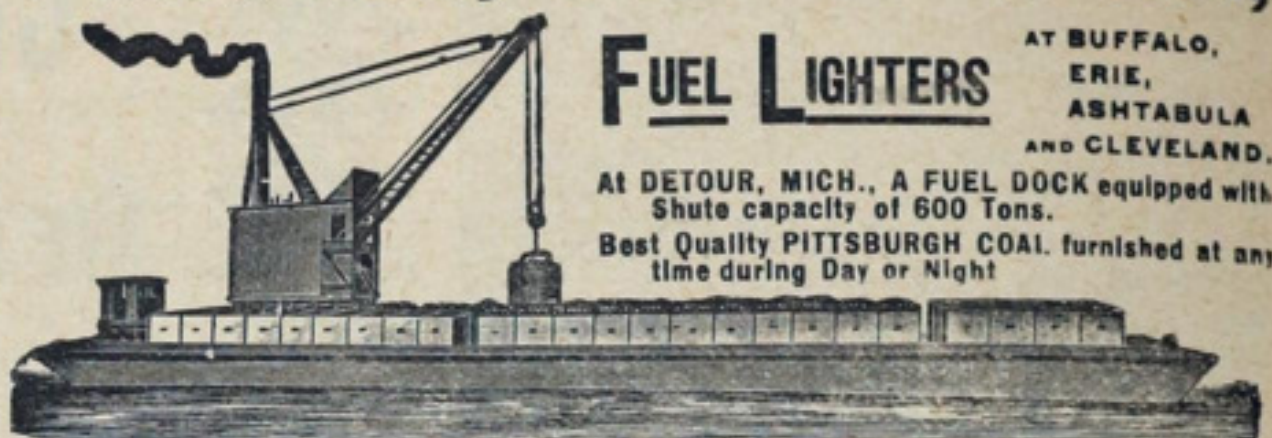
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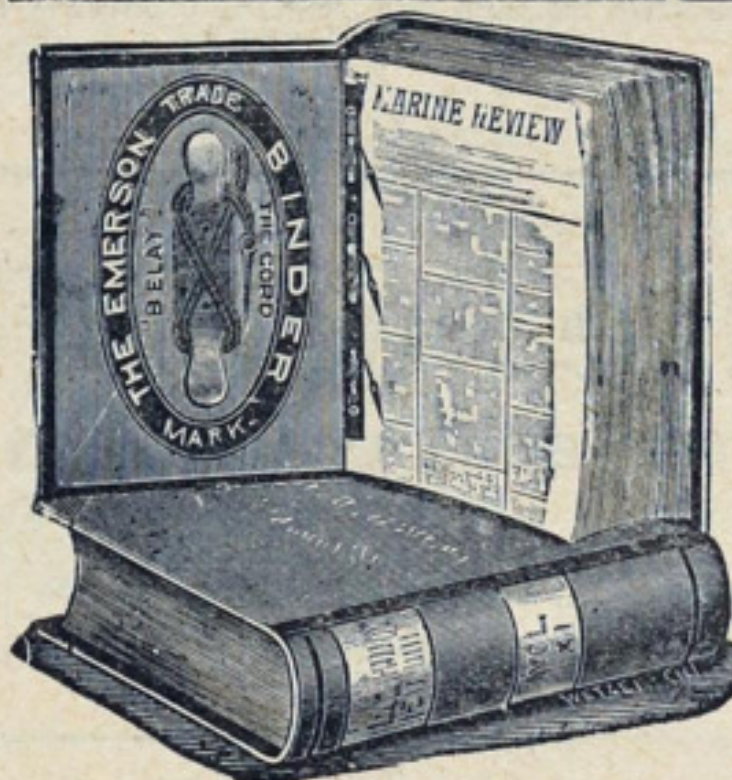
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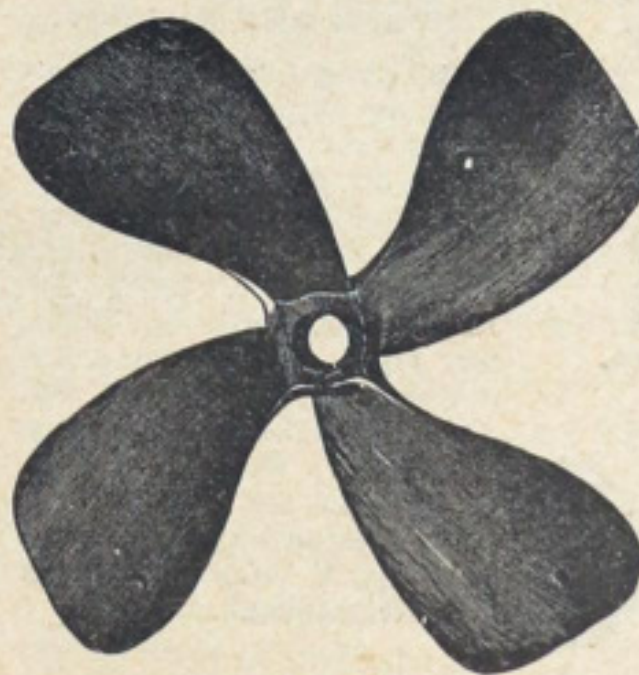
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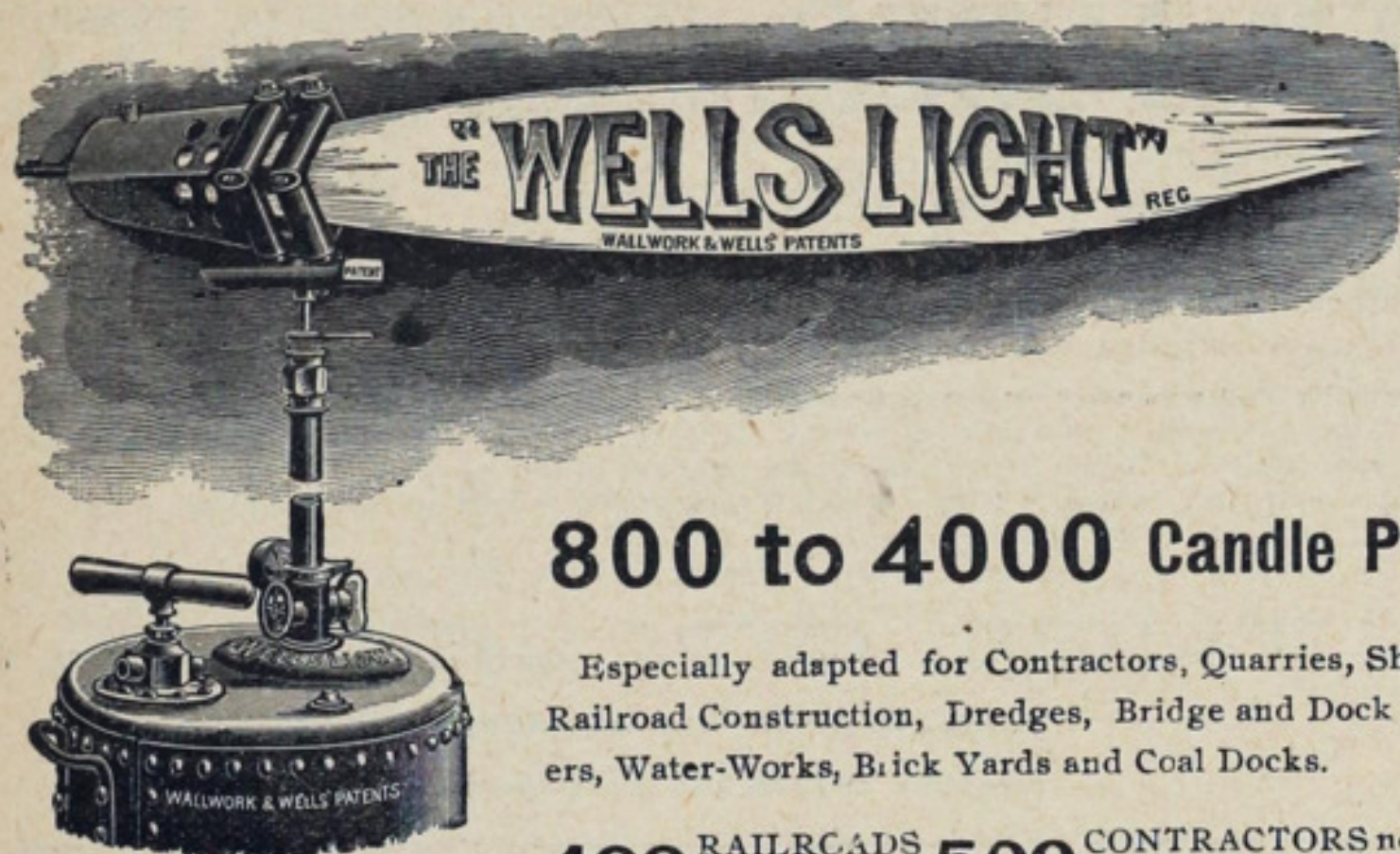
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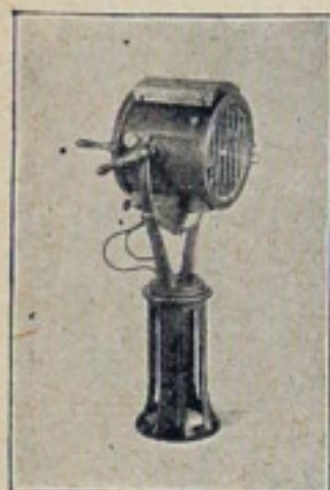
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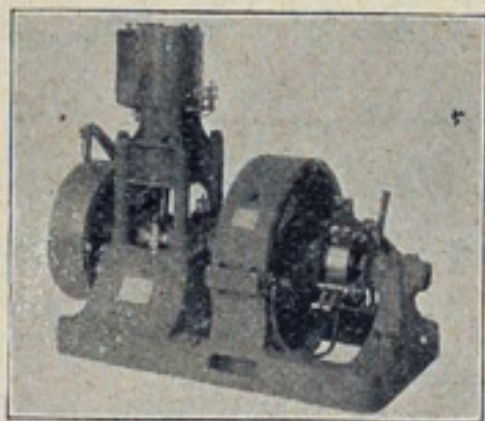
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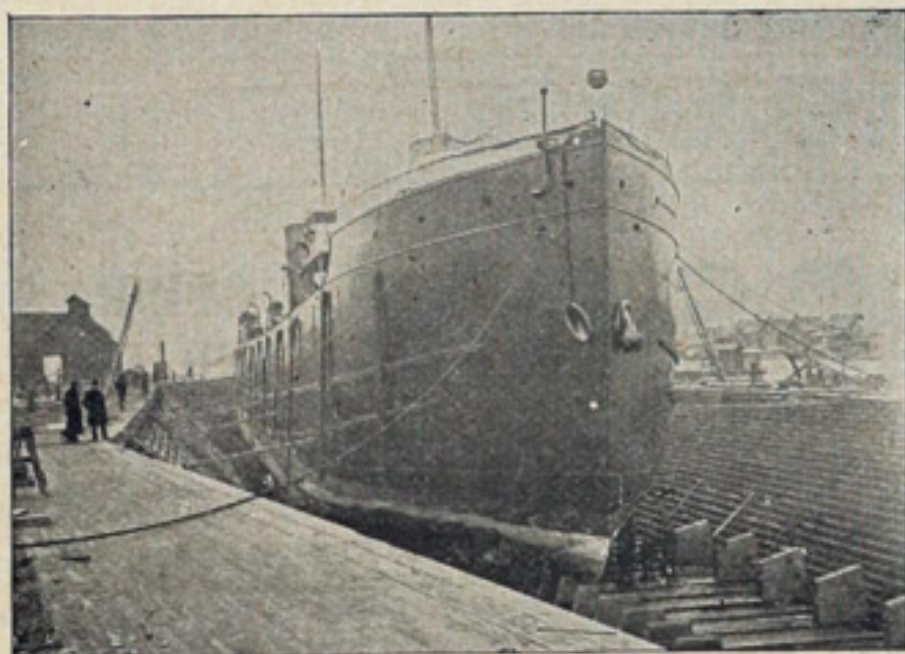


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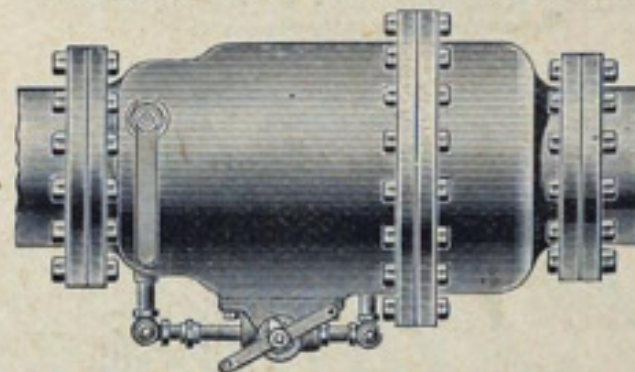


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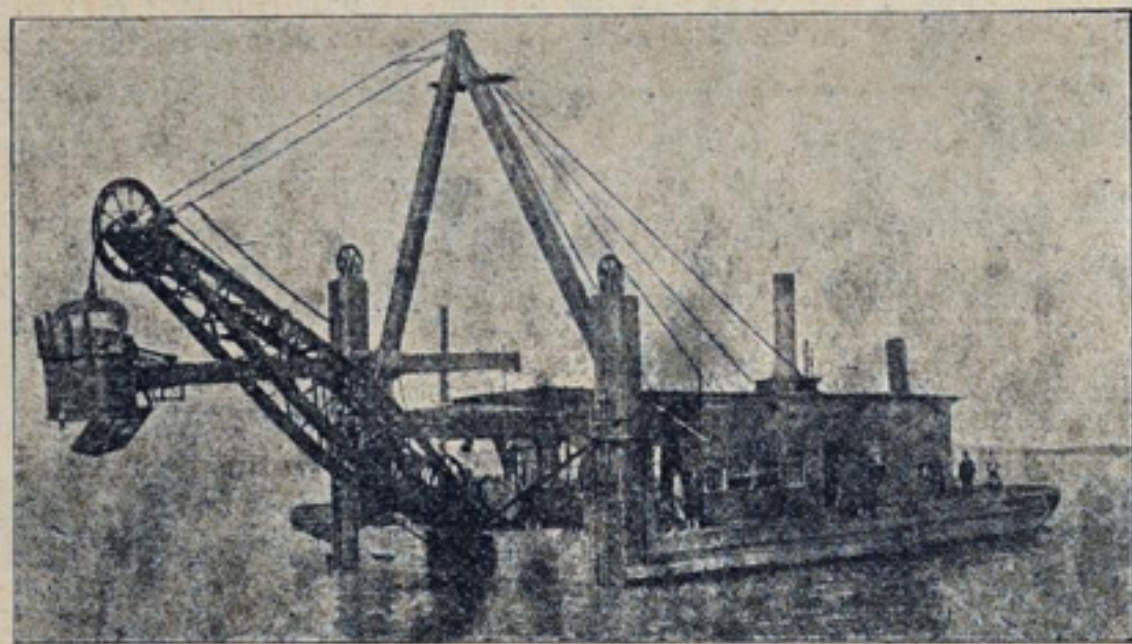
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